



Skills for Employment Investment Program (SEIP)

COMPETENCY-BASED LEARNING MATERIAL (FACULTY GUIDE) FOR MASONRY (CONSTRUCTION SECTOR)

Finance Division, Ministry of Finance
Government of the People's Republic of Bangladesh

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The Competency-based Learning Material (Faculty Guide) for Masonry is a document, aligned to its applicable competency standard, for providing training consistent with the requirements of industry in order for individuals who graduated through the established standard via competency-based assessment to be suitably qualified for a relevant job.

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Approval Sheet

Identification and validation of modules and content for this occupation were made by experts within this sector. A series of consultations were held to accurately capture industry and employer needs and expectations and develop the learning material that would help to enhance the employability of the youth trained. This process started on 30 April 2017 and concluded with a validation workshop with a sectoral working group on 10 August 2017.

Experts Involved

Industry and subject-matter experts who provided their valuable inputs to develop this competency-based learning material [April 2017 – August 2017]:

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Validation Workshop

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How to Use this Competency-based Learning Material

Welcome to the competency-based learning material for Masonry for use in construction works. These modules contain training materials and activities for learners to complete in order to become competent and qualified as a skilled worker.

There are eight (8) modules that make up this course which comprises the skills, knowledge and attitudes required to become a skilled worker including:

1. Prepare masonry mortar/stucco
2. Carry out pavement laying work
3. Establish building lines, locate and build footer
4. Carry out brick/block work
5. Accomplish masonry surface plastering
6. Perform pattern stone finishing work
7. Perform wall panelling using bricks/stones
8. Apply waterproofing activities in construction

As a trainer, you are required to guide the learners through a series of activities in order to complete each learning outcome of the module. These activities may be completed as part of structured classroom activities or they may be required to work at their own pace.

These activities will require the learners to complete associated learning and practice activities in order to gain knowledge and skills they need to achieve the learning outcomes. Refer to **Learning Activity Page of each module** to know the sequence of learning tasks and the appropriate resources to use for each task.

This page will serve as the road map towards the achievement of competence. If you read the **Information Sheets**, these will give you an understanding of the work, and why things are done the way they are. Once the learners have finished reading the Information Sheets, they are required to complete the questions in the **Self-Check Sheets**.

The self-check process follows the Information Sheets in the learning guide. Completing self-checks will help the learners know how they are progressing. To know how they fared with self-checks, they can review the **Answer Key**.

The learners are required to complete all activities as directed in the **Job Sheet**. This is where they will apply their newly acquired knowledge while developing new skills. When working, high emphasis should be laid on safety requirements. The learners should be encouraged to raise relevant queries or ask the facilitator for assistance as required.

When the learners have completed all the tasks required in the learning guide, an assessment event will be scheduled to evaluate if they have achieved competency of the specified learning outcomes and are ready for the next task.

Introduction to Teaching Adult Learners

Since you will be dealing with adult learners, it is important to understand the basic principles of adult learning and methodologies. Adults learn best through associations, experiences and application. A few facts to consider while teaching adult learners:

Discussion: Adult learning is best managed through mutual dialogue and discussion. Discussion needs to be encouraged and used in the classroom to maximise learning.

Associations: Adults have experiences which can be related to any learning objectives to create associations which enhance conceptual comprehension. Associations can be used to create user interest and gain attention. Adults learn new attitudes or skills best in relation to previous life experiences.



This strategy also ensures knowledge retention.

Create an environment conducive to learning and sharing: Make people feel comfortable talking to you and each other. They should feel at ease asking questions, sharing views even if they are not very sure of the efficacy of their suggestions or views.

Physical surroundings: Temperature, light, space and furniture should be optimal. There should be no distractions.

Inculcate respect: Encourage learners' contributions and experiences. People are more encouraged to learn and share when their experiences are acknowledged - new information builds easily on past knowledge and experience.

Reward and recognition: Acknowledging the efforts of people, even small attempts, can reap great benefits. Learners like to receive praise and positive encouragement, which motivates them to deliver their best.

Learners also like to be reassured that they are correctly recalling or using information they have absorbed in the classroom.

Structured teaching: Learners study faster when information or skills are presented in a structured way:

- Concepts to be taught in small, bite sized portions for easy assimilation
- Put forth the easiest ideas or skills first and then gradually build on them
- Bring in the important ideas first
- Reinforce key ideas at regular intervals
- Reinforce high order concepts at regular intervals

Move learner from generic to specific flow of information: Introduce the generic concepts first and then move to specific more complex information to ease understanding and comprehension.

Application of concepts/ideas taught: Help students put into practice the concepts taught in the class through exercises and work-based projects. Application ensures knowledge retention and skill building.

Relevance building: Build up relevance of the concepts being taught in class by relating them to day-to-day life and workplace experiences.

Learners should know to use and apply what they have learned in the classroom as they learn faster when they recognise that what they are learning will be useful in the future.

Sharing: Encourage learners to learn from each other and solve problems collectively. This makes learning easier and improves team spirit and the interpersonal skills of the learners.

Participation: Involve learners in the class - adults favour to be *active participants* in learning rather than passive receivers of knowledge. People learn faster when they actively process information, solve problems and practice skills.

Motivate: Inspire the class so that teaching does not become a one-way process of knowledge download. Learners will learn faster when they feel an inner urge to learn and be an active participant in the class.

Create a learning environment in which the learners feel free and able to shed their inhibitions and develop receptivity towards new ideas and concepts.

Students will have different motivation levels - some will be more eager to learn than others as each learner is different from the other and therefore need to be treated differently.

And remember - adapt your communication style to suit the needs of the audience.

Communicate effectively: Communicate in a manner that is understood by the class. The language and sentence structuring should be clear and succinct.

Technical concepts should be explained in a manner that de-mystifies the concept - make things simple and easy to understand.

Avoid using *too much* technical jargon - if it is part of the curriculum, ensure the class is first made familiar with the words or jargon used.

Assessments: Conduct skill and knowledge checks regularly:














- Reinforce high order concepts at regular intervals.
- Conduct formative and summative assessments.
- Strengthen areas which appear to be weak.

Regular feedback:

- Provide regular feedback to learners
- Help them identify their strengths and areas of improvement
- Feedback should always be constructive
- Timely and specific feedback is easier to accept and act on



List of Icons

Icon Name	Icon
Module content	
Learning outcomes	
Performance criteria	
Contents	
Assessment criteria	
Resources required	
Information sheet	
Self-check Quiz	
Answer key	
Activity	
Video reference	
Learner job sheet	
Assessment plan	
Review of competency	

Module 1: Prepare masonry mortar/stucco

Module Descriptor:	This module covers the skills, knowledge and attitudes to prepare masonry mortar/stucco which includes gathering mortar making tools, equipment and materials, preparing mortar mixing box/containment, making mortar/stucco, and cleaning and maintaining workplace.	
Nominal Duration:	22 hours	
Learning Outcomes:	1.1.	Gather mortar making tools, equipment and materials
	1.2.	Prepare mortar mixing box/containment
	1.3.	Make mortar/stucco
	1.4.	Clean and maintain workplace
Performance Criteria:	1.1.	Personal protective equipment (PPE) worn as required for the work performed
	1.2.	Tools, equipment and materials are gathered as per job requirement and check for usability
	1.3.	Mortar mixing box/containment cleaned before and after use
	1.4.	Sand and cement ratio are maintained and measured
	1.5.	Sand, cement and water are mixed in accordance with job specification
	1.6.	Appropriate transport used to carry materials at the workplace
	1.7.	Tools and equipment used are cleaned and stored as per standard practice



Learning Outcome 1.1 – Gather Mortar Making Tools, Equipment and Materials

Contents:	<ul style="list-style-type: none"> ▪ Names and uses of personal protective equipment (PPE) ▪ List of main tools and equipment required to prepare mortar/stucco ▪ Collection, checking and selection for usability of the necessary tools and equipment ▪ Name of different types of cement and their uses ▪ Procedures of storage of cement ▪ Quality of water necessary in construction works ▪ Classification of sand and their uses 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses, ear plugs/ear muffs ▪ Tools and equipment: wheel barrow, sieve, measuring box, mortar mixing box/containment, bucket, mug, steel pan, shovel/spade, trowel and mortar mixer ▪ Materials: cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.1.1	Information Sheet 1.1.1 Self-Check Quiz 1.1.1 Answer Key 1.1.1 https://www.sikana.tv/en/diy/masonry/safety-on-a-construction-sites	9 10 26
	1.1.1	Information Sheet 1.1.2 Self-Check Quiz 1.1.2 Answer Key 1.1.2	10 12 26
	1.1.1	Information Sheet 1.1.3 Self-Check Quiz 1.1.3 Answer Key 1.1.3	12 14 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements ▪ Quantity and quality of tools and equipment identified and gathered according to job requirements ▪ Quantity and quality of different types of materials to be used are placed in designated area ▪ Necessary tools and equipment are checked for their usability 		



Learning Outcome 1.2 - Prepare Mortar Mixing Box/Containment

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning mortar mixing box/containment: <ul style="list-style-type: none"> ○ Methods of cleaning: dusting, shaking and beating, sweeping, mopping and washing ○ Tools and equipment required for cleaning: dusters, polishing clothes, brooms, brushes, buckets and cotton rags ○ Cleaning materials: water, detergents and abrasives ○ Schedule of cleaning: weekly/monthly, spring/yearly and any time before and after use ▪ Advantages of proper placement of mortar mixing box/containment 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): Safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, mug and mortar mixing box/containment, cleaning tools and materials ▪ Materials: water 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.2.1	Information Sheet 1.2.1 Self-Check Quiz 1.2.1 Answer Key 1.2.1	15 16 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Mortar mixing box/containment is cleaned and prepared as per job requirement ▪ Mortar mixing box/containment is placed properly 		



Learning Outcome 1.3 – Make Mortar/Stucco

Contents:	<ul style="list-style-type: none"> ▪ Types of mortar ▪ Mortar mixing ratio ▪ How to mix mortar ▪ Methods of mixing mortar ▪ Water ratio ▪ Transport and handling of mortar 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses, ear plugs/ear muffs ▪ Tools and equipment: measuring box, mixing box/containment, shovel/spade, pails (bucket, mug), water storage drum, one bagger concrete mixer ▪ Materials: cement, fine aggregates, coarse aggregates, potable water 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.3.1	Information Sheet 1.3.1 Job Sheet 1 Self-Check Quiz 1.3.1 Answer Key 1.3.1 <ul style="list-style-type: none"> • How to Mix Cement Mortar by hand: https://www.youtube.com/watch?v=X0q_2VuFUOI • Bucket Mortar Mixer: https://www.youtube.com/watch?v=IORIZ1shRIM&t=8s 	18 20 21 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Mixing tools and equipment to be used are checked according to job requirements ▪ Materials are laid on mortar mixing box as per instruction ▪ Cement, sand and water are mixed according to specified proportion and consistency/workability ▪ Proper handling and use of mixing tools and equipment are observed 		



Learning Outcome 1.4 - Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 2: Carry out pavement laying work

Module Descriptor:	This module covers the knowledge, skills and attitudes to carry out pavement laying work which includes gathering pavement laying tools, equipment and materials, setting base for paving work and preparing raw materials, performing the laying of paving bricks/blocks, and cleaning and maintaining the workplace.	
Nominal Duration:	40 hours	
Learning Outcomes:	2.1.	Gather pavement laying tools, equipment and material
	2.2.	Set-up base for paving work and prepare raw materials
	2.3.	Perform laying of brick/block
	2.4.	Complete laying of brick/block
	2.5.	Clean and maintain workplace
Performance Criteria:	2.1.	Tools and equipment are gathered, checked and prepared in accordance with job requirements
	2.2.	Bricks, paving tiles/blocks are selected, collected and gathered at worksite
	2.3.	Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements
	2.4.	Reference building lines are correctly identified and located as per job requirements
	2.5.	Forms for pavement making are built as per job requirements
	2.6.	Base is levelled and tempered in accordance with job requirements
	2.7.	Mortar/grouting materials prepared and used as per specification and standard procedures
	2.8.	Proper alignment and level are maintained in accordance with the job requirements
	2.9.	Gaps between bricks/blocks are filled up with appropriate fillers
	2.10.	Curing is done before use of the newly built pavement
	2.11.	Tools and equipment are properly cleaned after use
	2.12.	All tools and equipment are stored following the standard procedures



Learning Outcome 2.1 - Gather Pavement Laying Tools, Equipment and Material

Contents:	<ul style="list-style-type: none"> ▪ List of main tools and equipment required pavement laying works ▪ Different types of bricks, paving tiles/blocks ▪ Names and uses of personal protective equipment (PPE) ▪ Name of different types of cement and their specific uses ▪ Quality of water necessary in construction works ▪ Classification of sand and their use 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, steel pan, mug, measuring box, shovel/spade, sieve, mortar mixer and mortar mixing box/containment, measuring tools, plumb bob, spirit level, nylon string, nail, mason's hammer, pointed trowel ▪ Materials: bricks/blocks, paving tiles, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	2.1.1	Information Sheet 2.1.1	30
	2.1.1	Information Sheet 2.1.2	30
	2.1.1	Information Sheet 2.1.3	30
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are gathered, checked and prepared in accordance with job requirements. ▪ Bricks, paving tiles/blocks are selected, collected and gathered at work site. ▪ Quality mortar/grouting materials are selected, collected and placed in designated area. ▪ Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements 		



Learning Outcome 2.2 – Set-up Base for Paving Work and Prepare Raw Materials

Contents:	<ul style="list-style-type: none"> ▪ Detail building plan/work drawing marked for brick/block laying ▪ Shape of the paving area ▪ Levelling and tempering of base ▪ Mortar/concrete ▪ Concreting raw materials: <ul style="list-style-type: none"> ○ Wood ○ Metal ○ Plastic 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason’s hammer, pointed trowel, form work, batter board, guide post ▪ Materials: bricks/blocks, cement, sand, gravel, water, forms (wood, metal & plastic) 		
Learning Activities:	Activity	Resource	Student Guide Page
2.2.1		Information Sheet 2.2.1 Self-Check Quiz 2.2.1 Answer Key 2.2.1	33 34 45
2.2.1		Information Sheet 2.2.2 Self-Check Quiz 2.2.2 Answer Key 2.2.2	34 35 45
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are gathered, checked and prepared in accordance with job requirements ▪ Bricks, paving tiles/blocks are selected, collected and gathered at work site ▪ Quality mortar/grouting materials are selected, collected and placed in designated area ▪ Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements 		



Learning Outcome 2.3 - Perform Laying of Bricks/Blocks

Contents:	<ul style="list-style-type: none"> ▪ Procedures in installing horizontal/vertical guide for brick/block ▪ Important steps for brick/block laying ▪ Mortar/concrete: <ul style="list-style-type: none"> ○ Lime mortar ○ Lime cement mortar ○ Cement sand mortar ○ Cement concrete ▪ Setting and alignment of lines: <ul style="list-style-type: none"> ○ Base line ○ Reference line ○ Paving line ▪ Setting out construction lines, perpendiculars and arcs: <ul style="list-style-type: none"> ○ Fastening string lines ○ Establishing straight lines ○ Setting out a perpendicular ○ Setting out arcs and curves ▪ Methods of bedding: <ul style="list-style-type: none"> ▪ Individual ▪ Screeding ▪ Spot ▪ Pattern and layouts: <ul style="list-style-type: none"> ▪ Single size pattern ▪ Multi-size pattern ▪ Random 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, wooden float, pointed trowel, form work, batter board, guide post ▪ Materials: bricks/blocks, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	2.3.1	Information Sheet 2.3.1	37
		Self-Check Quiz 2.3.1	39
		Answer Key 2.3.1	45
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Paving line and perpendicular line are set-up at two ends of the line as per plan ▪ Mortar is spread on the base/edge of brick/block according to job specifications 		

	<ul style="list-style-type: none">▪ Batter board at ± 3 mm tolerance for proper alignment is used as required▪ Bricks or blocks are positioned/laid according to pattern design/specifications/locations▪ Proper level is maintained in accordance with the job requirements▪ Constant checking of plumpness is done during brick/block laying
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Learning Outcome 2.4 - Complete Laying of Brick/Block

Contents:	<ul style="list-style-type: none"> ▪ Fillers: sand, cement grout, polyurethane concrete crack sealant, polymer-based sealers ▪ Brick/block laying tolerances ▪ Basic structural bonds and joints ▪ Local weather condition ▪ Curing 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, wooden float, pointed trowel, form work, batter board, guide post ▪ Materials: bricks/blocks, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	2.4.1	Information Sheet 2.4.1 Self-Check Quiz 2.4.1 Answer Key 2.4.1 www.theconstructioncivil.org/types-of-brick-bonds	41 43 45
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Gaps between bricks/blocks are filled up with appropriate fillers. ▪ Final checks are made in respect of level and alignment of bricks/blocks. ▪ Bricks or blocks are laid on the line at minimum allowance at 1/16 inch (2 mm). ▪ Tools, equipment and any surplus resources and materials are checked in accordance with established procedures. ▪ Curing is done before use of the newly built pavement 		



Learning Outcome 2.5 - Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 3: Establish building lines, locate and build footer

Module Descriptor:	This module covers the knowledge, skills and attitudes to establish building lines, locate and build footer which includes preparing the location of the building lines, building concrete footer with pile foundation, laying of brick or block structure, finishing brick or block laying work and curing, and cleaning and maintaining workplace.	
Nominal Duration:	40 hours	
Learning Outcomes:	3.1.	Prepare location of the building lines
	3.2.	Build up concrete footer
	3.3.	Laying of brick or block structure
	3.4.	Finish brick or block laying work and curing
	3.5.	Clean and maintain workplace
Performance Criteria:	3.1.	Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements
	3.2.	Tools and equipment are selected and prepared in accordance with job requirements
	3.3.	Bricks, paving tiles/blocks are selected, collected and gathered at worksite
	3.4.	Building plans read and correctly interpreted
	3.5.	Reference building lines are correctly identified and located as per job requirements
	3.6.	Lumber and form boards are installed in accordance to building plan
	3.7.	Bricks and blocks are positioned, laid and levelled as per job requirements
	3.8.	Curing is done in accordance with workplace specifications
	3.9.	Tools, equipment and workplace are properly cleaned in accordance with job requirements



Learning Outcome 3.1 - Prepare Location of the Building Lines

Contents:	<ul style="list-style-type: none"> ▪ Building drawing: site plans, floor plans, foundations plans, elevation and section through the entire building, working drawings, reference building lines and building lay-out 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, measuring tap, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, form work, mason's square, compass ▪ Building drawing set and drawing instruments and accessories 		
Learning Activities:	Activity	Resource	Student Guide Page
	3.1.1	Information Sheet 3.1.1	47
		Self-Check Quiz 3.1.1	48
		Answer Key 3.1.1	60
	3.1.1	Information Sheet 3.1.2	48
	3.1.1	Information Sheet 3.1.3	48
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Building plans are read and interpreted correctly ▪ Building lines are located in accordance with the building plan ▪ Established proper alignment and dimension as per job requirements ▪ Horizontal and perpendicular guide for brick or block is properly installed 		



Learning Outcome 3.2 – Build-up Concrete Footer

Contents:	<ul style="list-style-type: none"> ▪ Building lay-out ▪ Formwork installation ▪ Ingredients of concrete ▪ Proportion of concrete 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, shovel/spade, mixer, measuring tap, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, form work, hand saw, rip saw, mason's square, trowel, wheel barrow, sieve, bucket, mug, steel pan ▪ Materials: cement, fine aggregate (sand), coarse aggregate (brick/stone chips), water ▪ Building drawing set 		
Learning Activities:	Activity	Resource	Student Guide Page
	3.2.1	Information Sheet 3.2.1 Self-Check Quiz 3.2.1 Answer Key 3.2.1	50 51 60
	3.2.2	Information Sheet 3.2.2 Self-Check Quiz 3.2.2 Answer Key 3.2.2	51 51 60
	3.2.3	Information Sheet 3.2.3 Self-Check Quiz 3.2.3 Answer Key 3.2.3	51 52 60
	3.2.4	Information Sheet 3.2.4 Self-Check Quiz 3.2.4 Answer Key 3.2.4	52 53 60
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Locations of the concrete footers are identified in accordance with the building plan ▪ Lumber and form boards are installed and levelled as per job requirements ▪ Width and depth of footer is set in accordance to workplace specifications ▪ Concrete mix or mortar is poured properly 		



Learning Outcome 3.3 - Laying of Brick or Block Structure

Contents:	<ul style="list-style-type: none"> ▪ Types of brick: based on using and manufacturing ▪ Classification of bricks on shape ▪ Types of concrete block ▪ Procedures in installing horizontal/vertical guide for brick/block ▪ Brick/block laying procedures ▪ Definition of pile and classification 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, wooden float, pointed trowel, form work, batter board, guide post ▪ Materials: bricks/blocks, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	3.3.1	Information Sheet 3.3.1 Self-Check Quiz 3.3.1 Answer Key 3.3.1 www.bunnings.com.au/diy-advice/home-improvement/walls/how-to-build-a-brick-wall	55 56 60
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Bricks or blocks laid on the line at minimum allowance at 1/16 inch (2mm) ▪ Mortar is spread and filled on the base and gaps according to job specifications ▪ Bricks/blocks are positioned/laid according to designed specifications ▪ Appropriate levelling device is used in each course 		



Learning Outcome 3.4 - Finish Brick or Block Laying Work and Curing

Contents:	<ul style="list-style-type: none"> ▪ Lay of bricks/blocks ▪ Process of mortar spreading ▪ Checking level periodically with the help of spirit level and plumb bob ▪ Brick/block laying tolerances ▪ Basic structural bonds and joints ▪ Curing methods and time 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, shovel/spade, mixer, measuring tap, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, form work, hand saw, rip saw, mason's square, trowel, wheel barrow, sieve, bucket, mug, steel pan ▪ Materials: cement, fine aggregate (sand), coarse aggregate (brick/stone chips), water ▪ Building drawing set 		
Learning Activities:	Activity	Resource	Student Guide Page
	3.4.1	Information Sheet 3.4.1 www.theconstructioncivil.org/types-of-brick-bonds	58
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Final checks are made with the foreman to ensure that works conform with instructions and to workplace requirements ▪ Mortar is spread and filled on the base and gaps according to job specifications ▪ Standard procedures are followed on bricks/blocks laying works ▪ Appropriate levelling device is used in each course ▪ The structure is cured in accordance to job specifications 		



Learning Outcome 3.5 - Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 4: Carry out brick/block works

Module Descriptor:	This module covers the knowledge, skills and attitudes to carry out stone and brick works which includes gathering masonry working tools, equipment and materials, organizing bricks/blocks, creating cement mortar/stucco, preparing brick/block for installation, carrying-out brick/block installation work, and cleaning and maintaining workplace.	
Nominal Duration:	40 hours	
Learning Outcomes:	4.1.	Gather masonry working tools, equipment and material
	4.2.	Organise bricks/blocks at worksite
	4.3.	Create cement mortar/stucco
	4.4.	Prepare brick/block for installation
	4.5.	Carry out brick/block installation work
	4.6.	Clean and maintain workplace
Performance Criteria:	4.1.	Tools and equipment are gathered, checked and prepared in accordance with job requirements
	4.2.	Bricks and blocks are selected, collected and gathered at worksite
	4.3.	Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements
	4.4.	Proper transport is used for carrying materials
	4.5.	Scaffolding is set as per job requirements
	4.6.	Bricks/blocks are organised at work site as per job requirements
	4.7.	Cement, sand and water are mixed according to specified proportion and consistency/workability
	4.8.	Centre lines, string lines are measured and marked as per drawing
	4.9.	Cement mortar is applied uniformly
	4.10.	Closer and bats are used to maintain specified bond
	4.11.	Joints are filled up with mortar/stucco for better adhesion and raking out brick/block joints is done as per instruction
	4.12.	Tools and equipment are properly cleaned, and waste materials are disposed of in proper place as per instruction



Learning Outcome 4.1 - Gather Masonry Working Tools, Equipment and Materials

Contents:	<ul style="list-style-type: none"> ▪ List of main tools and equipment required pavement laying works ▪ Different types of bricks and blocks ▪ Names and uses of personal protective equipment (PPE) ▪ Name of different types of cement and their uses ▪ Quality of water necessary in construction works ▪ Classification of sand and their uses 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, steel pan, mug, measuring box, shovel/spade, sieve, mortar mixer and mortar mixing box/containment, measuring tools, plumb bob, spirit level, nylon string, nail, mason's hammer, pointed trowel ▪ Materials: bricks/blocks, cement, sand, water and scaffolding 		
Learning Activities:	Activity	Resource	Student Guide Page
	4.1.1	Information Sheet 4.1.1 <ul style="list-style-type: none"> ▪ https://theconstructor.org/building/types-of-scaffolding-in-construction ▪ https://www.youtube.com/watch?v=BWWkoelZwtY 	64
	4.1.1	Information Sheet 4.1.2	64
	4.1.1	Information Sheet 4.1.3 Self-Check Quiz 4.1.1 Answer Key	64 64 78
	4.1.1	Information Sheet 4.1.4 Self-Check Quiz 4.1.2 Answer Key	65 65 78
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are gathered, checked and prepared in accordance with job requirements ▪ Bricks and blocks are selected, collected and gathered at worksite ▪ Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements ▪ Proper transport is used for carrying materials ▪ Scaffolding is set as per workplace requirement 		



Learning Outcome 4.2 - Organise Bricks/Blocks at Work Site

Contents:	<ul style="list-style-type: none"> ▪ Types of brick: based on using and manufacturing ▪ Classification of bricks on shape ▪ Types of concrete block ▪ Cleaning and soaking of brick 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, wooden float, pointed trowel, form work, batter board, scaffolds, guide post ▪ Materials: bricks/blocks, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	4.2.1	Information Sheet 4.2.1 Self-Check Quiz 4.2.1 Answer Key 4.2.1	67 69 78
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Quality of bricks/blocks are checked and segregated as per workplace requirements ▪ Bricks/blocks are cleaned and soaked in accordance to specification ▪ Bricks/blocks are organized at worksite as per job requirements 		



Learning Outcome 4.3 - Create Cement Mortar/Stucco

Contents:	<ul style="list-style-type: none"> ▪ Types of mortar ▪ Mortar mixing ratio ▪ How to mix mortar ▪ Methods of mixing mortar ▪ Water ratio ▪ Transport and handling of mortar 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses, ear plugs/ear muffs ▪ Tools and equipment: measuring box, mixing box/containment, shovel/spade, pails (bucket, mug), water storage drum, one bagger concrete mixer ▪ Materials: cement, fine aggregates, coarse aggregates, potable water 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.3.1	Information Sheet 1.3.1 Job Sheet 1 Self-Check Quiz 4.3.1 Answer Key 4.3.1 <ul style="list-style-type: none"> • How to Mix Cement Mortar by hand: https://www.youtube.com/watch?v=X0q_2VuFUOI • Bucket Mortar Mixer: https://www.youtube.com/watch?v=IORIZ1shRIM&t=8s 	18 20 70 78
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Mixing tools and equipment to be used are checked according to job requirements ▪ Materials are laid on mortar mixing box as per instruction ▪ Cement, sand and water are mixed according to specified proportion and consistency/workability ▪ Proper handling and use of mixing tools and equipment are observed 		



Learning Outcome 4.4 - Prepare Brick/Block for Installation

Contents:	<ul style="list-style-type: none"> ▪ Building drawing: <ul style="list-style-type: none"> ○ Location drawings and general arrangement drawings ○ Block plans ○ Site plans ○ Floor plans ○ Foundations plans ○ Roof plans ○ Elevations ○ Section through the entire building ▪ Preliminary drawings ▪ Sketch drawings ▪ Working drawings ▪ Building lay-out ▪ Reference building lines ▪ Centre lines ▪ Linear, angular and offset measurements 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level or levelling instrument, nylon string, nail, mason's hammer, pointed trowel, form work, reference of level point ▪ Building drawing set 		
Learning Activities:	Activity	Resource	Student Guide Page
	4.4.1	Information Sheet 4.4.1 Self-Check Quiz 4.4.1 Answer Key 4.4.1	72 73 78
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Centre lines are measured and marked as per drawing ▪ Reference of level is identified and set out as per job requirements ▪ Linear and angular measurements are marked as required ▪ String lines are established in accordance with job requirements 		



Learning Outcome 4.5 - Carry Out Brick/Block Installation Work

Contents:	<ul style="list-style-type: none"> ▪ Lay of bricks/blocks ▪ Process of mortar spreading ▪ Checking level periodically ▪ Raking out joints ▪ Basic structural bonds and Joints ▪ Closers and bats 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, trowel, mason's square, bucket, mug, wheel barrow, broom and scaffold ▪ Materials: bricks/blocks, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	4.5.1	Information Sheet 4.5.1 Self-Check Quiz 4.5.1 Answer Key 4.5.1 <ul style="list-style-type: none"> ▪ www.self-build.co.uk/how-build-brick-wall ▪ www.bunnings.com.au/diy-advice/home-improvement/walls/how-to-build-a-brick-wall 	75 76 78
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Bricks/blocks are watered as per instruction ▪ Cement mortar is applied uniformly ▪ Bricks/blocks are laid and aligned along the set-out lines following specified bond ▪ Closer and bats are used to maintain specified bond ▪ Joints are filled up with mortar/stucco for better adhesion ▪ Raking out brick/block joints is done as per instruction 		



Learning Outcome 4.6 - Clean Tools, Equipment and Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 5: Accomplish masonry surface plastering

Module Descriptor:	This module covers the knowledge, skills and attitudes to accomplish masonry surface plastering which includes preparing the masonry surface, mixing mortar, applying plaster on plain surfaces and corners, and cleaning and maintaining the workplace.	
Nominal Duration:	40 hours	
Learning Outcomes:	5.1.	Prepare masonry surfaces for plastering
	5.2.	Mix mortar for plastering on masonry surface
	5.3.	Apply plaster on plain surfaces and corners
	5.4.	Clean and maintain workplace
Performance Criteria:	5.1.	Personal protective equipment (PPE) is identified, gathered and used properly
	5.2.	Scaffolding is prepared as per job requirements
	5.3.	Materials, tools and equipment are selected and prepared in line with job requirements
	5.4.	Raking out the joints and chipping are performed as required
	5.5.	Masonry surface is cleaned and washed for plastering
	5.6.	Foreign materials are separated from sand by sieving/screening
	5.7.	Dry cement and sand are mixed until the mixture is uniform
	5.8.	Water is gradually added and mixed to form specified consistency
	5.9.	Uneven surface is scratched and repeated while plaster is still soft
	5.10.	Corner is properly finished by using corner trowel
	5.11.	Alignment, perpendicular, angularity is adjusted as required
	5.12.	Finished plaster is cured in accordance to workplace specifications
	5.13.	Tools and equipment are cleaned and stored accordingly
	5.14.	Waste materials are disposed of and entire work area is cleaned as per instruction



Learning Outcome 5.1- Prepare Masonry Surfaces for Plastering

Contents:	<ul style="list-style-type: none"> ▪ Names and uses of personal protective equipment (PPE) ▪ List of main tools & equipment required cement plastering ▪ Collection, checking and selection for usability of the necessary tools and equipment ▪ Name of different types of cement and their uses ▪ Classification of sand and their uses ▪ Quality of water necessary in construction works ▪ Name different types of scaffolding ▪ Procedure of raking out of joints 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, cold chisel, chipping hammer, steel brush, broom, scaffolding, hose pipe, bucket, mug, wheel barrow ▪ Materials: Cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	5.1.1	Information Sheet 5.1.1 <ul style="list-style-type: none"> ▪ https://www.youtube.com/watch?v=BWWkoelZwtY ▪ (https://theconstructor.org/building/types-of-scaffolding-in-construction) 	82
	5.1.1	Information Sheet 5.1.2	82
	5.1.1	Information Sheet 5.1.3	82
		Self-Check Quiz 5.1.1	83
		Answer Key 5.1.1	91
	5.1.1	Information Sheet 5.1.4	84
	5.1.1	Information Sheet 5.1.5	84
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements ▪ Quantity and quality of tools & equipment identified and gathered according to work requirements ▪ Quantity and quality of different types of materials to be used are placed in designated area ▪ Necessary tools and equipment are checked for their usability ▪ Scaffolding is set as required ▪ Joints are raked out as using appropriate tools and following standard procedures ▪ Surface is cleaned and washed for plastering 		



Learning Outcome 5.2 - Mix Mortar for Plastering on Masonry Surface

Contents:	<ul style="list-style-type: none"> ▪ Foreign materials ▪ Cement ▪ Sand ▪ Water ▪ Proportion of cement and sand ▪ Mortar mixing ratio: <ul style="list-style-type: none"> ○ For brick laying, below ground and superstructure (thickness of wall) ○ For plastering, inner sides and outer sides (thickness of plaster) ○ For concrete (lime concrete, cement concrete, reinforced cement concrete) ▪ Methods of mixing mortar: <ul style="list-style-type: none"> ○ Mixing a batch by hand ○ Mixing a batch with a Mixer ▪ Water ratio: <ul style="list-style-type: none"> ○ Maintain the correct water ratio ○ Demerits of excess or less water added 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: One bagger concrete mixer, mixing box/containment, shovel/spade, pails (bucket, mug), water storage drum, potable water, measuring box ▪ Materials: cement, aggregates (sand suitable for masonry works), 		
Learning Activities:	Activity	Resource	Student Guide Page
	5.2.1	Information Sheet 5.2.1 <ul style="list-style-type: none"> ▪ https://www.youtube.com/watch?v=X0q_2VuFUOI ▪ https://www.youtube.com/watch?v=IORIZ1shRIM&t=8s 	86
	5.2.1	Information Sheet 5.2.2 Self-Check Quiz 5.2.1 Answer Key 5.2.1	86 86 91
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Foreign materials are separated from sand by sieving/screening ▪ Quantity of sand is placed in a dry and plane platform as per requirement ▪ Cement is equally spread on sand in accordance to specification ▪ Dry cement and sand are mixed until the mixture is uniform ▪ Water is gradually added and mixed to form specified consistency ▪ Prepared mortar is used within the schedule period 		



Learning Outcome 5.3 - Apply Plaster on Plain Surface and Corners

Contents:	<ul style="list-style-type: none"> ▪ Process of applying of plaster ▪ Ground work for plaster: fixation of dots and screeds ▪ Application of first coat or under coat or rendering coat ▪ Application of second coat or finishing or fine coat 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, mixer, broom, bucket, mug, different types of trowel, outside & inside corner trowel, wooden float, steel float, plumb bob, nail, foam/soft brush, scaffold ▪ Cement mortar/stucco 		
Learning Activities:	Activity	Resource	Student Guide Page
	5.3.1	Information Sheet 5.3.1 Self-Check Quiz 5.3.1 Answer Key 5.3.1 <ul style="list-style-type: none"> ▪ https://www.youtube.com/watch?v=2r4nreZCyho ▪ https://www.youtube.com/watch?v=P8_DX.. ▪ https://www.youtube.com/watch?v=d2Aq82WTFH0 	88 89 91
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Surface level is checked using appropriate levelling tools ▪ Uneven surface is scratched and repeated while plaster is still soft ▪ Wooden trowel and wetted foam are used to finish the surface ▪ Corner is initially set using a flat trowel and finished by using corner trowel ▪ Alignment, perpendicular, angularity is adjusted as required ▪ Finished plaster is cured in accordance to workplace specification 		



Learning Outcome 5.4 - Clean and Maintain Work Area

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 6: Perform pattern stone finishing work

Module Descriptor:	This module covers the knowledge, skills and attitudes required to perform pattern stone finishing work which includes planning out pattern stone work, gathering tools, equipment and materials, mixing pattern stone materials, pouring cement mixture, curing of concrete, and cleaning and maintaining the workplace.	
Nominal Duration:	32 hours	
Learning Outcomes:	6.1.	Plan out for pattern stone work
	6.2.	Gather tools, equipment and materials
	6.3.	Mix pattern stone materials
	6.4.	Pour cement mixture for pattern stone and curing
	6.5.	Clean and maintain workplace
Performance Criteria:	6.1.	Building drawings are read and interpreted according to work requirements
	6.2.	Materials, tools, equipment and man-hours are correctly estimated for completing the job
	6.3.	Quality of cement, sand, coarse aggregate and water are checked and determined required quantity
	6.4.	Tools and equipment are gathered, checked and prepared in accordance with job requirements
	6.5.	Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements
	6.6.	Cement, sand, coarse aggregate and water are mixed according to specified proportion and consistency
	6.7.	Test cubes/cylinder are made, and slump test is performed under direct supervision
	6.8.	Proper transporting method of concrete is used
	6.9.	Concrete admixtures are identified and used in accordance to job requirements
	6.10.	Formwork is checked in accordance with job specifications
	6.11.	Mixed materials are placed in layers and vibrated to avoid air trapping
	6.12.	Poured mixture is levelled using appropriate levelling device
	6.13.	Tools and equipment are cleaned and stored following the standard procedures



Learning Outcome 6.1- Plan Out for Pattern Stone Work

Contents:	<ul style="list-style-type: none"> ▪ Building drawing: <ul style="list-style-type: none"> ○ Plan ○ Elevation ○ Section ▪ Methods of estimate: <ul style="list-style-type: none"> ○ Materials ○ Equipment ○ Man-hours ▪ Quality of materials: <ul style="list-style-type: none"> ○ Cement ○ Sand ○ Khoa/chips ○ Water 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, pan, mug, measuring box, shovel/spade, sieve, mortar mixer and mortar mixing box/containment ▪ Materials: cement, sand, coarse aggregate and water ▪ Building drawings 		
Learning Activities:	Activity	Resource	Student Guide Page
	6.1.1	Information Sheet 6.1.1 Self-Check Quiz 6.1.1 Answer Key 6.1.1	94 95 111
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Building drawings are interpreted according to work requirements ▪ Materials, tools, equipment and man-hours are correctly estimated for completing the job ▪ Quality of cement, sand, coarse aggregate and water are checked and placed in designated area ▪ Quantity of cement, sand, coarse aggregate and water are determined as per job requirement 		



Learning Outcome 6.2 - Gather Tools, Equipment and Materials

Contents:	<ul style="list-style-type: none"> ▪ List of main tools and equipment required for pattern stone works ▪ Different types of pattern stones ▪ Names and uses of personal protective equipment (PPE) ▪ Name of different types of cement and their specific uses ▪ Quality of water necessary in construction works ▪ Classification of sand according to grain size and sources and their proper uses 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, steel pan, mug, measuring box, shovel/spade, sieve, mortar mixer and mortar mixing box/containment, measuring tools, plumb bob, spirit level, nylon string, nail, mason's hammer, pointed trowel ▪ Materials: pattern stones, cement, sand, coarse aggregates and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	6.2.1	Information Sheet 6.2.1	96
	6.2.1	Information Sheet 6.2.2	97
	6.2.1	Information Sheet 6.2.3	97
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are gathered, checked and prepared in accordance with job requirements. ▪ Pattern stones are selected, collected and gathered at work site. ▪ Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements 		



Learning Outcome 6.3 – Mix Pattern Stone Materials

Contents:	<ul style="list-style-type: none"> ▪ Bulking of sand ▪ Mixing proportions ▪ Water cement ration ▪ Test cube or cylinder ▪ Slump test ▪ Concrete admixtures 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, trowel, mason's square, bucket, mug, wheel barrow, broom, cube and cylinder moulds and slump test equipment set ▪ Materials: cement, sand, coarse aggregate, water and admixtures 		
Learning Activities:	Activity	Resource	Student Guide Page
	6.3.1	Information Sheet 6.3.1	100
		Job Sheet 2	102
		Job Sheet 3	104
		Self-Check Quiz 6.3.1	105
		Answer Key 6.3.1	111
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Mixing tools and equipment to be used are checked according to job requirements ▪ Materials are laid on mortar mixing box as per instruction ▪ Cement, sand, coarse aggregate and water are mixed according to specified proportion and consistency ▪ Test cubes/cylinder are made, and slump test is performed under direct supervision ▪ Proper transporting method of concrete is used ▪ Concrete admixtures are identified and used in accordance to job requirements 		



Learning Outcome 6.4 – Pour Cement Mixture for Pattern Stone

Contents:	<ul style="list-style-type: none"> ▪ Different types of formworks ▪ Setting time of cement ▪ Importance of vibration of concrete ▪ Methods of vibration ▪ Curing process 		
Resources Required:	<ul style="list-style-type: none"> ▪ Checklist of tools and materials ▪ Formworks ▪ Vibrators 		
Learning Activities:	Activity	Resource	Student Guide Page
	6.4.1	Information Sheet 6.4.1 Self-Check Quiz 6.4.1 Answer Key 6.4.1	106 107 111
	6.4.1	Information Sheet 6.4.2 Self-Check Quiz 6.4.2 Answer Key 6.4.2	107 108 111
	6.4.1	Information Sheet 6.4.3 Self-Check Quiz 6.4.1 Answer Key 6.4.1	108 109 111
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Formwork is checked in accordance with job specifications ▪ Mixed materials are placed in layers and vibrated to avoid air trapping ▪ Poured mixture is levelled using appropriate levelling device ▪ Pattern stone surface is finished properly ▪ Curing is done as per instruction 		



Learning Outcome 6.5 - Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 7: Perform wall panelling using bricks/stones

Module Descriptor:	This module covers the knowledge, skills and attitudes to perform wall panelling using bricks/stones which includes gathering tools and materials, organizing for wall panelling works using bricks/stones, preparing wall surface for brick/stone panelling, mixing mortar/bonding components, accomplishing wall panelling works, and cleaning and maintaining the workplace.	
Nominal Duration:	32 hours	
Learning Outcomes:	7.1.	Gather tools, equipment and materials
	7.2.	Organise for wall panelling works using bricks/stones
	7.3.	Prepare wall surface for brick/stone panelling
	7.4.	Mix mortar/bonding components
	7.5.	Accomplish wall panelling works
	7.6.	Clean/maintain the workplace
Performance Criteria:	7.1.	Tools and equipment are gathered, checked and prepared in accordance with job requirements
	7.2.	Bricks and blocks are selected, collected and gathered at worksite
	7.3.	Scaffolding is set as per workplace requirements
	7.4.	Appropriate personal protective equipment (PPE) is used and demonstrated according to job requirements
	7.5.	Plans and drawings are read and interpreted according to job requirements
	7.6.	Bricks/stones are checked for usability/quality and organised at worksite
	7.7.	Cement mortar/bonding materials are prepared and mixed in accordance to workplace specifications
	7.8.	Setting time of cement is identified
	7.9.	Brick/stone panelling base is soaked in water
	7.10.	Brick/stone is installed in accordance with workplace specifications
	7.11.	Closer and bats are used to maintain specified bond
	7.12.	Grooves are filled up with mortar for better adhesion
	7.13.	Tools and equipment are cleaned and stored following the standard procedures
	7.14.	Waste materials are disposed of and workplace is cleaned and kept in safe state



Learning Outcome 7.1 – Gather Tools, Equipment and Materials

Contents:	<ul style="list-style-type: none"> ▪ List of main tools and equipment required for brick/stone panelling works ▪ Different types of bricks and stones ▪ Names and uses of personal protective equipment (PPE) ▪ Name of different types of cement and their specific uses ▪ Quality of water necessary in construction works ▪ Classification of sand according to grain size and sources and their proper uses ▪ Types of scaffolding and materials uses 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: wheel barrow, bucket, steel pan, mug, measuring box, shovel/spade, sieve, mortar mixer and mortar mixing box/containment, measuring tools, plumb bob, spirit level, nylon string, nail, mason’s hammer, pointed trowel ▪ Materials: bricks/blocks, cement, sand, water and scaffolding materials 		
Learning Activities:	Activity	Resource	Student Guide Page
	7.1.1	Information Sheet 7.1.1 <ul style="list-style-type: none"> ▪ https://www.youtube.com/watch?v=BWWkoelZwtY ▪ (https://theconstructor.org/building/types-of-scaffolding-in-construction) 	114
	7.1.1	Information Sheet 7.1.2	114
	7.1.1	Information Sheet 7.1.3 Self-Check Quiz 7.1.3 Answer Key 7.1.3	114 116 128
	7.1.1	Information Sheet 7.1.4	116
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are gathered, checked and prepared in accordance with job requirements ▪ Bricks and blocks are selected, collected and gathered at worksite ▪ Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements ▪ Proper transport is used for carrying materials ▪ Scaffolding is set as per workplace requirements 		



Learning Outcome 7.2 – Organise for Wall Panelling Works Using Bricks/Stones

Contents:	<ul style="list-style-type: none"> ▪ Types of brick: <ul style="list-style-type: none"> ○ Common Burnt Clay ○ Sand Lime (Calcium Silicate) ○ Engineering ○ Concrete ○ Fly ash Clay Based on using: <ul style="list-style-type: none"> ○ Facing ○ Engineering ○ Common ○ Paving ▪ Based on manufacturing: <ul style="list-style-type: none"> ○ Unburnt ○ Burnt ○ First class ○ Second class ○ Third class ▪ Classification on shape: <ul style="list-style-type: none"> ○ Solid ○ Hollow ○ Curved ○ Perforated ▪ Types of stones or rocks: <ul style="list-style-type: none"> ○ Igneous ○ Sedimentary ○ Metamorphic 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, mixing board, mixer, shovel/spade, sieve, measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason's hammer, wooden float, pointed trowel, form work, batter board, scaffolds, guide post ▪ Materials: bricks, stones, cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	7.2.1	Information Sheet 7.2.1 Self-Check Quiz 7.2.1 Answer Key 7.2.1	118 119 128
	7.2.1	Information Sheet 7.2.1 Self-Check Quiz 7.2.1	119 120

	Answer Key 7.2.1	128
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Quality of bricks/stones are checked and segregated as per job requirements ▪ Bricks/stones are cleaned and soaked in accordance to specification ▪ Bricks/stones are organised at work site as per job requirements. ▪ Building plans and drawings are read and correctly interpreted 	



Learning Outcome 7.3 – Prepare Wall Surface for Brick/Stone Panelling

Contents:	<ul style="list-style-type: none"> ▪ Foreign materials: <ul style="list-style-type: none"> ○ Dust ○ Oil ○ Cement ○ Sand ○ Dirt ▪ Cleaning of bricks/tiles/blocks ▪ Surface cleaning ▪ Priming of surfaces 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring tools, plumb bob, level hose, spirit level, nylon string, nail, mason’s hammer, cold chisel, chipping hammer, steel brush, broom, scaffolding, hose pipe, bucket, mug, wheel barrow ▪ Materials: water and other priming materials 		
Learning Activities:	Activity	Resource	Student Guide Page
	7.3.1	Information Sheet 7.3.1	122
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Wall surfaces are ensured for free of any foreign materials ▪ Wall panelling bricks/tiles/blocks are cleaned before uses ▪ Wall surfaces are cleaned and primed in accordance to workplace specifications 		



Learning Outcome 7.4 – Mix Mortar/Bonding Components

Contents:	<ul style="list-style-type: none"> ▪ Types of mortar ▪ Mortar mixing ratio ▪ How to mix mortar ▪ Methods of mixing mortar ▪ Water ratio ▪ Transport and handling of mortar 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses, ear plugs/ear muffs ▪ Tools and equipment: measuring box, mixing box/containment, shovel/spade, pails (bucket, mug), water storage drum, one bagger concrete mixer ▪ Materials: cement, fine aggregates, coarse aggregates, potable water 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.3.1	Information Sheet 1.3.1 Job Sheet 1 Self-Check Quiz 1.3.1 Answer Key 1.3.1 <ul style="list-style-type: none"> • How to Mix Cement Mortar by hand: https://www.youtube.com/watch?v=X0q_2VuFUOI • Bucket Mortar Mixer: https://www.youtube.com/watch?v=IORIZ1shRIM&t=8s 	18 20 21 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Mixing tools and equipment to be used are checked according to job requirements ▪ Materials are laid on mortar mixing box as per instruction ▪ Cement, sand and water are mixed according to specified proportion and consistency/workability ▪ Proper handling and use of mixing tools and equipment are observed 		



Learning Outcome 7.5 – Accomplish Wall Panelling Works

Contents:	<ul style="list-style-type: none"> ▪ Setting time of cement ▪ Bonding materials: <ul style="list-style-type: none"> ○ Cement ○ Lime ○ Sand ○ Pozzolanic fly ash ○ Bonding products (adhesive/admixture) ▪ Installation of bricks/stones ▪ Closers and bats 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: measuring box, shovel/spade, mixer, mixing board, broom, bucket, mug, trowel, wooden float, steel float, plumb bob, nail, foam/soft brush, scaffold, sieve, wheel barrow ▪ Materials: cement, sand, water, bricks and/or stones 		
Learning Activities:	Activity	Resource	Student Guide Page
	7.5.1	Information Sheet 7.5.1	125
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Setting time of cement is identified ▪ Appropriate bonding materials for panelling works are used in accordance to workplace specifications ▪ Cement mortar/adhesive is applied uniformly as per standard practices ▪ Bricks/stones are installed in accordance to workplace specifications ▪ Closer and bats are used as per job requirements ▪ Groves are filled up with cement mortar for better adhesion ▪ Level and alignment are done in accordance with established procedures 		



Learning Outcome 7.6 – Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		

Module 8: Apply waterproofing activities in construction

Module Descriptor:	This module covers the knowledge, skills and attitudes required for a worker in applying waterproofing activities in construction which includes organising work area for waterproofing, preparing concrete prior to waterproofing, applying waterproofing material, performing other waterproofing considerations, and cleaning and maintaining the workplace.	
Nominal Duration:	32 hours	
Learning Outcomes:	8.1.	Organise work area for waterproofing
	8.2.	Prepare concrete prior to waterproofing
	8.3.	Applying waterproofing material
	8.4.	Perform other waterproofing considerations
	8.5.	Clean and maintain workplace
Performance Criteria:	8.1.	Building drawing, work instructions and operational details relevant information is collected, read and considered as per job requirements
	8.2.	Signage and barricade requirements are identified and removed as required
	8.3.	Required tools and equipment are selected for waterproofing purposes
	8.4.	Appropriate materials for waterproofing works and personal protective equipment (PPE) for safety purposes are identified, obtained and prepared as per workplace requirements
	8.5.	Related environmental requirements are identified and conformed in accordance to specifications
	8.6.	Waterproofing materials is identified as per job requirements
	8.7.	Potential faults, contingencies and techniques are identified as per requirements
	8.8.	Waterproofing materials is checked for conformity and compatibility with substrate materials
	8.9.	Substrates to be water proofed are prepared and prime coated with waterproofing materials in accordance to job specifications
	8.10.	Waterproofing materials are mixed and applied in accordance to specification and job requirements
	8.11.	Quality of works is checked, and defects are rectified
	8.12.	Finishing requirements are applied in accordance to waterproofing plan
	8.13.	Suitable roof sealer is applied if cast is used in place of concrete
	8.14.	Proper flow of water is ensured and checked the drainage system in line with job requirements
	8.15.	Tools and equipment are cleaned and stored as per organisational procedures
	8.16.	Waste materials are disposed of in proper place and the work area is cleaned



Learning Outcome 8.1- Organise Work Area for Waterproofing

Contents:	<ul style="list-style-type: none"> ▪ Names and uses of personal protective equipment (PPE) ▪ List of main tools and equipment required to prepare mortar/stucco ▪ Collection, checking and selection for usability of the necessary tools and equipment ▪ Name of different types of cement and their uses ▪ Procedures of storage of cement ▪ Quality of water necessary in construction works ▪ Classification of sand and their uses 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety glasses, ear plugs/ear muffs ▪ Tools and equipment: wheel barrow, sieve, measuring box, mortar mixing box/containment, bucket, mug, steel pan, shovel/spade, trowel and mortar mixer ▪ Materials: cement, sand and water 		
Learning Activities:	Activity	Resource	Student Guide Page
	8.1.1	Information Sheet 8.1.1	130
	8.1.1	Information Sheet 8.1.2	131
	8.1.1	Information Sheet 8.1.3 Self-Check Quiz 8.1.1 Answer Key 8.1.1	131 132 147
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Appropriate personal protective equipment (PPE) are used and demonstrated according to job requirements ▪ Quantity and quality of tools and equipment identified and gathered according to job requirements ▪ Quantity and quality of different types of materials to be used are placed in designated area ▪ Necessary tools and equipment are checked for their usability 		



Learning Outcome 8.2- Prepare Concrete Prior to Waterproofing

<p>Contents:</p>	<ul style="list-style-type: none"> ▪ Types of mortar: <ul style="list-style-type: none"> ○ Lime ○ Lime-cement ○ Cement ○ Lime concrete ○ Cement concrete ▪ Mortar mixing ratio: <ul style="list-style-type: none"> ○ For brick laying, below ground and superstructure (thickness of wall) ○ For plastering, inner sides and outer sides (thickness of plaster) ○ For concrete (lime concrete, cement concrete, reinforced cement concrete) ▪ How to mix mortar: <ul style="list-style-type: none"> ○ Step 1: Gather materials and tools needed for mortar ○ Step 2: Mix the dry ingredients ○ Step 3: Add water to the dry ingredients ○ Step 4: Use the mortar ○ Step 5: Clean the tools and workplace ▪ Methods of mixing mortar: <ul style="list-style-type: none"> ○ Mixing a batch by hand ○ Mixing a batch with a Mixer 		
<p>Resources Required:</p>	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: One bagger concrete mixer, mixing box/containment, shovel/spade, pails (bucket, mug), water storage drum, potable water, measuring box ▪ Materials: Cement, aggregates (sand suitable for masonry works), aggregates (brick/stone chips) 		
<p>Learning Activities:</p>	<p>Activity</p>	<p>Resource</p>	<p>Student Guide Page</p>
<p>8.2.1</p>		<p>Information Sheet 8.2.1 Job Sheet 4 Self-Check Quiz 8.2.1 Answer Key 8.2.1</p>	<p>134 137 138 147</p>
<p>Assessment Criteria:</p>	<ul style="list-style-type: none"> ▪ Mixing tools and equipment to be used are checked according to job requirements ▪ Materials are laid on mortar mixing box as per instruction ▪ Cement, sand and water are mixed according to specified proportion and consistency/workability ▪ Proper handling and use of mixing tools and equipment are observed 		



Learning Outcome 8.3- Apply Waterproofing Material

Contents:	<ul style="list-style-type: none"> ▪ Substrates ▪ Prime coat ▪ Membrane ▪ Roof sealer ▪ Topographic conditions ▪ Procedure of waterproofing 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, mixer, broom, bucket, mug, trowel, wooden float, steel float, plumb bob, nail, foam/soft brush ▪ Materials: cement/concrete mortar, sealing materials 		
Learning Activities:	Activity	Resource	Student Guide Page
	8.3.1	Information Sheet 8.3.1 Self-Check Quiz 8.3.1 Answer Key 8.3.1	140 141 147
	8.3.1	Information Sheet 8.3.2	141
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Water proofing materials is checked for conformity and compatibility with substrate materials. ▪ Substrates to be water proofed are prepared and prime coated with waterproofing materials in accordance to job specification. ▪ Water proofing materials are mixed and applied in accordance to specification and job requirements. ▪ Water proofing membrane is prepared as per requirements. ▪ Quality of work is checked, and defects are rectified. ▪ Finishing requirements are applied in accordance to waterproofing plan. ▪ Suitable roof sealer is applied if cast is used in place of concrete. ▪ Proper flow of water is ensured and checked the drainage system in line with job requirements 		



Learning Outcome 8.4- Perform Other Waterproofing Considerations

Contents:	<ul style="list-style-type: none"> ▪ Finishing requirements ▪ Roof sealer ▪ Drainage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth, hand gloves, dust mask, safety glasses ▪ Tools and equipment: shovel/spade, mixer, broom, bucket, mug, trowel, wooden float, steel float, plumb bob, nail, foam/soft brush ▪ Materials: cement/concrete mortar, sealing materials 		
Learning Activities:	Activity	Resource	Student Guide Page
	8.4.1	Information Sheet 8.4.1	143
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Finishing requirements are applied in accordance to waterproofing plan. ▪ Suitable roof sealer is applied if cast is used in place of concrete. ▪ Proper flow of water is ensured and checked the drainage system in line with job requirements 		



Learning Outcome 8.5 – Clean and Maintain Workplace

Contents:	<ul style="list-style-type: none"> ▪ Importance and necessity of cleaning tools & equipment and work place ▪ Methods of cleaning, tools and equipment required for cleaning ▪ Lubricants ▪ Advantages of proper storing of tools and equipment; types of storage 		
Resources Required:	<ul style="list-style-type: none"> ▪ Personal protective equipment (PPE): helmet, safety shoes, safety cloth/apron, hand gloves, dust mask, safety goggles ▪ Cleaning tools and equipment: brooms, dusters, dust pans, cleaning brushes, mops, waste containers and cotton rags ▪ Materials: water, detergents, abrasives, bleaches, lubricants 		
Learning Activities:	Activity	Resource	Student Guide Page
	1.4.1	Information Sheet 1.4.1 Self-Check Quiz 1.4.1 Answer Key 1.4.1 https://en.wikipedia.org/wiki/Cleaning_agent	22 25 26
Assessment Criteria:	<ul style="list-style-type: none"> ▪ Tools and equipment are properly cleaned after use. ▪ Appropriate tools and equipment are lubricated according to standard procedures. ▪ All tools and equipment are stored following the standard procedures. ▪ Waste materials are disposed as per instruction in proper place. ▪ Workplace is cleaned and kept in safe state in line with OHS regulations 		