

NATIONAL BOARD FOR TECHNICAL EDUCATION

NATIONAL VOCATIONAL CERTIFICATE (NVC)

CURRICULUM AND COURSE SPECIFICATIONS

IN

BLOCK-LAYING AND CONCRETING

2007

PLOT 'B' BIDA ROAD, PMB 2239 KADUNA – NIGERIA

NATIONAL VOCATIONAL CERTIFICATE (NVC) IN BLOCK-LAYING AND CONCRETING

1.0 GOAL:

The National Vocational Certificate in Block-laying and Concreting is aimed at producing skilled and self-reliant craftsmen that can execute and coordinate Block-laying and Concreting work in a construction project.

2.0 OBJECTIVES:

On completion of this programme, the trainee craftsmen should be able to:

- a) Read and interpret building construction drawings.
- b) Apply basic safety principles of construction procedures.
- c) Apply basic safety principles of contracture procedures.
- d) Identify block laying and concreting materials and their uses.
- e) Produce sound reinforced and mass concrete structures to specify callous.
- f) State the materials used for finishing and their applications in constructor works.
- g) Supervise simple construction projects.
- h) Set up subcontract business in Block-laying and Concreting works.
- i) Demonstrate basic principles of site organization.

3.0 ENTRY QUALIFICATION:

The minimum entry qualification into the National Vocational Certificate in Block-laying and concreting programme is Post Basic Education Certificate (Post JSS) or any equivalent qualification or at least 7 years of relevant practical qualification.

4.0 STRUCTURE OF PROGRAMME:

The National Vocational Certificate (NVC) Block laying and Concreting programme is in flexible modular form, and is structured to have three parts (i.e. NVC Part I, NVC Part II, and NVC Final) each taken in a span of one year. Each part shall have a cogent and flexible structure and content that would allow the trainee a practical working skill unit and the possibility to exit at that level. Each part incorporates six months intensive training in the school and three months of supervised industrial work experience (SIWES).

5.0 EVALUATION SCHEME:

In a 15 weeks term, 12 weeks will be for academic activities while 1 week will be for registration and 2 weeks will be for evaluation. For a 40hrs week, 6hrs will be for core theory courses; 2hrs General education courses and 32 hrs will be for practical.

The National Vocation Certificate Examination must be externally moderated. In grading the awards; theory shall constitute- 20%, practical - 50% and SIWES- 30%. If there are group practical/projects, trainees must be assessed periodically on individual basis and records kept. **Note that trainees are to be assessed on completion of every module.**

All failed courses should be re-sited for until when the candidate is able to clear them. The grading shall be Distinction (70 and above), Credit (55-69), Pass (40-54), Fail (0-39) kept.

6.0 SIZE OF THE PROGRAMME:

The programme should have an intake of 25 trainees per stream to a maximum of three streams per session.

**NATIONAL VOCATIONAL CERTIFICATE (NVC) IN BLOCK-LAYING AND CONCRETING
CURRICULUM TABLE**

No	Code	Module	Part-I						Part-II						Part-III						TOTAL			
			Term-1			Term-2			Ter m-3	Term-1			Term-2			Ter m-3	Term-1			Term-2			Ter m-3	
			T	P	U	T	P	U		T	P	U	T	P	U		T	P	U	T		P		U
1	MTH	Mathematics	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	
2	Eng	English Language	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	1	-	1	
3	TED	Technical Drawing	-	4	4	-	4	4	-	4	4	-	4	4	-	4	4	-	4	4	-	4	4	
4	Ent	Entrepreneurship	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	
5.	Phy	Physics	2	3	5	2	3	5																
6.	Chem	Chemistry	2	3	5	2	3	5																
7.	ICT	Intro to Computer Application	1	3	4	1	3	4																
8	VBC 101	Intro to Bldg Construction -1	2	6	8	2	6	8																
9.	VBC 202	Intro to Bldg Construction -2							2	6	8	2	6	8										
10.	VBC 301	Intro to Bldg Construction -3																						
11.	VBC 111	Block-laying/Bricklaying - 1	1	9	10	1	9	10																
12	VBC 212	Block-laying/Bricklaying - 2							1	9	10	1	9	10										
13.	VBC 311	Block-laying/Bricklaying - 3																						
14.	VBC 121	Concreting -1	1	9	10	1	9	10																
15.	VBC 222	Concreting -2							1	9	10	1	9	10										
16.	VBC 321	Concreting -3																						
17.	VBC 131	Superstructure - 1	1	9	10	1	9	10																
18.	VBC 232	Superstructure - 2							1	9	10	1	9	10										
19.	VBC 331	Superstructure - 3																						
20	VBC 341	Site Org. and Supervision																						
TOTAL			13	47	60	13	47	60		8	38	46	8	38	46		9	41	50	8	38	46		

Introduction to Building Construction

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING

MODULE: INTRODUCTION TO BUILDING CONSTRUCTION -1

Course Code: VBC 101

Contact Hours: 2-6-8

GOAL: This module is designed to introduce the trainee in the building trades to the basic construction safety, common tools, site preparation, setting out and leveling methods so that he may be able to appreciate the roles of the various trades in the building industry

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the basic workshop safety, site safety principles and be able to apply them.
2. Know the use of common hand tools and building trades
3. Understand the basic principles of site preparation
4. Understand setting out principles and be able to apply them to set out simple rectangular buildings on site.
5. Understand basic principles of leveling and be able to carry out simple leveling project in construction

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING						
COURSE: INTRODUCTION TO BUILDING CONSTRUCTION-1			COURSE CODE: VBC 101		CONTACT HOURS: 2-6-8	
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0: Understand basic workshop and site safety principles and methods.				General Objective: Apply basic workshop and site safety principles and methods.		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-2	<p>1.1 List the various hazards in the construction site and state their causes and ways of prevention.</p> <p>1.2 Name dangerous gases and liquids in common use in the construction site e.g. paint frames, flammable liquids, acetylene</p> <p>1.3 Define relevant clauses in the factory act on Health, Safety and Welfare Regulations for workers on a construction site.</p> <p>1.4 Define and cite relevant clauses in the factory act on Health, safety and Welfare Regulations for workers on a construction site.</p>	<ul style="list-style-type: none"> • Teacher should arrange to use slide, video films, Computer simulation etc. to • Show films and photo clips of the hazards that can be caused by poisonous and dangerous gases e.g. paint fumes, carbon mono oxide etc. * Use health safety regulation act to explain some points the trainees. 	<ul style="list-style-type: none"> • Well equipped first aid box with drugs, banding cotton wool, iodine etc. • Safety signs, hand, gloves, boots, protective clothing, goggles etc. • Circular saw, grinding, machine, and drilling machines etc. 	<p>1.1 Identify hazardous components of construction equipments e.g. drilling machines, grinding, machine and circular saw etc.</p> <p>1.2 Apply appropriate First Aid Treatment on a victim in need of First Aid. e.g. burns, shocks, accident victims etc.</p> <p>1.3 Undertake habitual maintenance of health, safety and general welfare of the individual. .Identify what safety is and how to prevent accidents, generally.</p> <p>1.4 Select tools for specific craft operations e.g.</p> <p>a. Cutting b. Laying</p>	<ul style="list-style-type: none"> • Various movable hand tools and machines should be displayed and show to students and the methods of safe handling explained. • Show and explain proper handling of construction equipments and how to prevent accidents. • Use dummy to demonstrate the application of 1st Aid on a victims. 	<ul style="list-style-type: none"> • Drilling, grinding cutting machine circular saw, molding machine etc. • Dummy, first Aid box well equipped with drugs, bandage, cotton wool, iodine etc.

NVC in Block Laying and Concreting (Draft)

2-3	<p>1.5 Apply appropriate first Aid treatment on a victim involved in burns, shocks accident victims etc.</p> <p>1.6 Carry out habitual maintenance of health, safety and general welfare of the individual.</p> <p>1.7 Identify what safety is and how to prevent accidents, generally.</p>	<p>Write on the chalkboard for the students to copy the relevant clauses.</p> <p>Give examples for students to learn at home. Use safety equipment to practice the application of first aid on victims, this could be done in the classroom to reinforce the knowledge being imparted to the student.</p>				<ul style="list-style-type: none"> • Safety signs, hand gloves, boots protective clothing goggles etc. • Circular saws, and drilling machined etc
<p>General Objective: 2.0: Understand common hand tools used in construction trades.</p>			<p>General Objective: 2.0. Use common construction hand tools correctly.</p>			
WEEK	Specific Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
3-6	<p>2.1 Describe the basic hand tools in plumbing work and state their functions.</p> <p>2.2 Describe the basic hand tools in carpentry and joinery and state their functions.</p> <p>2.3 Describe the basic hand tools in painting and Decorating and state their uses.</p>	<ul style="list-style-type: none"> • Sketch basic plumbing, carpentry and painting workshop hand tools. 	<ul style="list-style-type: none"> • Basic hand tools for: <ul style="list-style-type: none"> a. carpenters b. painters c. plumbers 	<p>2.1 Identify and describe the basic hand tools in block laying and concreting work and state their functions.</p> <p>2.2 Understand the repair, routine care and maintenance of hand tools in use in the workshops.</p>	<ul style="list-style-type: none"> • Show and practically handle block laying and concreting work tools with students. • Show students the basic maintenance of hand tools. 	<ul style="list-style-type: none"> • Basic hand tools for block laying and concreting work.

	General Objective: 3.0: Understand the basic principles of site preparation.			General Objective: 3.0 Carryout Undertake Site Preparation Exercises Observing Necessary Procedures.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teacher's Activities	Resources
6-9	3.1 Define vegetable soil and identify same. 3.2 Describe site preparation and procedures prior to setting out. 3.3 Explain the importance of site investigation and preparation prior to setting out. 3.4 Identify hand tools and mechanical plants used for excavation.	<ul style="list-style-type: none"> • Use question and answer techniques • Show student various hand tools used for earth excavation. • Visit a new construction site with the students. 	<ul style="list-style-type: none"> • Vegetable soil. • Digger, trowel, excavator, anger etc 	3.1 identify and describe vegetable soil 3.2 Guide trainee in site clearance work of a given site	Show students vegetable soil	<ul style="list-style-type: none"> - a given site - trowels - shovels - spades -earth moving equipment. • Builders square • Tape • Pegs • Trammel • Line • Profiles
	General Objective: 4.0: Understand setting out principles on site.			General Objective: Set out simple rectangular building on site.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teacher's Activities	Resources
9-11	4.1 Define and explain the principles of setting out of buildings.	<ul style="list-style-type: none"> • Discuss the principles of setting out of buildings. 	<ul style="list-style-type: none"> • Chalkboard, sketches etc. 	4.1 Set out a simple rectangular building on site.	<ul style="list-style-type: none"> • Demonstrate with practical example. 	<ul style="list-style-type: none"> • Pegs, profile, nails, line, T-square, Iron square etc. * Setting out equipment, etc.

NVC in Block Laying and Concreting (Draft)

11-17	<p>4.2 Sketch, and describe the method of pegging out the perimeter walls of a building.</p> <p>4.3 Explain with sketches the use of timber profiles in setting out</p> <p>4.4 Identify and explain the basic equipment required for setting out on site.</p> <p>4.5 Describe at least two ways to check accuracy of a given setting out.</p> <p>4.6 Describe the process of construction of plain and irregular shapes for irregular shapes.</p> <p>4.7 Identify the line and peg method.</p> <p>4.8 Sketch, and describe the method of pegging out the perimeter walls of a building.</p> <p>4.9 Explain with sketches the use of timber profiles in setting out</p> <p>4.10 Identify and explain the basic equipment required for setting out on site.</p>	<ul style="list-style-type: none"> • Use sketches to explain why timber is used as setting out profiles. • Describe the basic equipment needed for setting out. 				
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NVC in Block Laying and Concreting (Draft)

	General Objective: 5.0: Understand basic principles of construction of foundations.			General Objective: Construct of simple foundation for domestic building		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teacher's Activities	Resources
17-24	<p>5.1 Define leveling.</p> <p>5.2 Identify various tools and equipment used in transferring levels i.e.</p> <p>a. Plumb level and pegs b. water level c. bunny rods and pegs d. leveling instrument.</p> <p>5.3 Describe the process of leveling i.e. rise and fall method and instrument height.</p>	<ul style="list-style-type: none"> • Guide trainee in construction of solid walls • List various equipment used in leveling. • Describe each method of leveling and their accuracy. • Explain the two methods. a. rise and fall, and b. instrument height. • Compute reduced level from given data and ask trainees to do same 	<ul style="list-style-type: none"> • Spirit/Plumb level • Transparent tiny rubble tube • Pegs • Borning rods • Dumpy level • Titing level 	Construct solid walls of thickness ½B-1½B involving ends, junction and quoins in English and Flemish bonds	<ul style="list-style-type: none"> • Guide trainee in construction of solid walls to the thickness of ½B-1½B involving ends, junctions and quoins in English bond and Flemish bond. 	<ul style="list-style-type: none"> • Bricks, Trowel, Spirit ,level jointing board, mortar etc

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING

MODULE: INTRODUCTION TO BUILDING CONSTRUCTION-2

Course Code: VBC 202

Contact Hours: 2-6-8

GOAL: This module is designed to introduce the trainee in the building trades to the basic construction principles in substructure work and other elements of building construction.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand basic principles of choice and construction of foundation
2. Understand and be able to apply basic principles and practice relating to substructure construction
3. Understand the principles of ground and upper floor construction in timber and concrete
4. Understand the principle of constructing load bearing walls
5. Know materials and methods used in fixing openings

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING						
COURSE: INTRODUCTION TO BUILDING CONSTRUCTION-2			COURSE CODE: VBC 202		CONTACT HOURS: 2-6-8	
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0: Understand the Basic Principles of Constructing Foundations.				General Objective: 6.0 Design and Construct Simple Foundations for Domestic Buildings.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
1-5	1.1 Define and explain the functions of foundation. 1.2 Describe the different types of foundations indicating their suitability. 1.3 State the problems that may be encountered during the construction work in the following situations:- a. water logged site b. pit/alluvial soil c. congested one plot side d. site requiring demolition of existing structures. 1.4 Describe equipment and methods used in excavating foundation trenches. 1.5 Sketch and describe temporary supports to the sides of deep trenches in various soils.	<ul style="list-style-type: none"> • Show pictures of excavating machines • Explain the functions of the equipment. 	<ul style="list-style-type: none"> • Chalkboard etc. • Films, clips, pictures, sketches etc. 	* Organize and lay strip foundation under the supervision by the teacher.	.Show basic methods of constructing foundation	<ul style="list-style-type: none"> • Cement • Mortar • Aggregates • Equipment and tools • Concrete

NVC in Block Laying and Concreting (Draft)

	General Objective: 2.0: Understand the Basic Principles And Practice Relating to Substructure Construction.			General Objective: 2.0: Apply Principles of Sub-structure in Construction.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
5-10	2.1 Identify the properties of different types of soil 2.2 Select the necessary tools for manual excavation. 2.3 Describe mechanism by drawing various earths moving equipment. 2.4 Distinguish between site and soil investigation 2.5 Describe the various ways of site drainage. 2.6 Define the bearing capacity of a soil. 2.7 Solve some problems involving bearing capacity.	- Samples of soils displayed and their properties identified. - Display charts posters and pictures illustrating the mechanism of the earth moving equipments. - Identify various ways of site drainage.	<ul style="list-style-type: none"> • Real object i.e. sample of soils. • Charts. • Pictures. • Chalkboard. • Complete drawing instrument. • T. Square. • Pair of compass. • Lesson notes 	2.1 Carry out sub structural work beginning from site clearance to trench excavation And preparation of excavated surfaces to receive concrete. 2.2 pour concrete to surface of excavated surfaces and lay blocks on foundation concrete,	Guide trainee in the execution of sub structural work.	Digger, shovels, profile line etc. - Timber scaffold tabular scaffold. - Coupler, Putlog Transom. Mixer, coarse aggregate fine aggregate, cement, water etc, Blocks, trowel, spirit level joint board hawk, mortar etc.

NVC in Block Laying and Concreting (Draft)

10-12	<p>2.8 Identify methods of preventing collapse of trench.</p> <p>2.9 Define the angle of response.</p> <p>2.10 Identify with sketches the timbering system for the following situations.</p> <ol style="list-style-type: none"> a. Shallow trench in moderately firm soil. b. Shallow trench in loose soil. c. Shallow trench in water logged area. <p>2.11 State necessary precautions for safe working conditions.</p> <p>2.12 State the reasons of the following craft practice.</p> <ol style="list-style-type: none"> a. Ramping of trench base before casting concrete foundation. b. Casting concrete foundation. c. Antiterm application d. Ramming in layers very deep refill. <p>2.13 Describe the functions of foundations.</p> <ol style="list-style-type: none"> a. List types of foundations. b. Sketch different types of foundations. c. Identify their uses. 	<p>-Sump hole</p> <p>-Laying of perforated pipes.</p> <p>-Dewatering etc.</p> <p>-The teacher draws the timbering suitable for loose shallow trench and gives assignment.</p> <p>- Teacher names types of timber used in timbering trenches</p> <p>-Explain safe working condition in excavated trenches</p> <p>Materials used for concrete for foundation.</p>	<p>- Complete drawing instrument.</p> <p>- T-Square</p> <p>- Pairs of compass.</p> <p>- Lesson notes</p>			
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NVC in Block Laying and Concreting (Draft)

	General Objective: 3.0: Understand the Principles of ground and upper floor construction in timber and Concreting			General Objective: 3.0: Construct timber/concrete floors.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
12-16	3.1 Describe and state the various functions of floors 3.2 Describe various types of floors and methods of construction. 3.3 Describe various types of floorings and their application. 3.4 Describe the equipment and methods used in mixing concrete on site.	Identify the various types of floors available and describe the functions of each type to the student.	Concrete aggregates	3.1 Select appropriate tools and equipment for floor construction 3.2 Transfer/spread level with pegs to ensure a flat surface. 3.3 Spread concrete to required thickness and vibrate adequately. 3.4 Cure concrete adequately 3.5 Prepare and lay joist to level using appropriate joint	*Guide trainee in the selection of tools and construction of timber and concrete floors.	-Trowel, Spirit level, Pegs, Nails, Vibrator, etc

NVC in Block Laying and Concreting (Draft)

	General Objective: 4.0: Understand the Principles of Constructing Load Bearing Walls.			General Objective: 4.0: Prepare Wall Opening and Fix Components Accurately.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Objective	Teachers Activities	Resources
16-20	4.1 Know the principal functions of external walls and internal walls. 4.2 Describe various types of wall units in common use. 4.3 Know typical mixes for mortar used for bonding wall units in 4.2 above. 4.4 Describe the procedures and precautions involved in mixing of concrete and mortar on 4.5 Explain the function, method of placing and position of DPC in walls.	*List functions of external walls and their uses *List types of ratio in mortar mix for bonding * Describe D.P.C. and differentiate between D.P.C. and D.P.M.	*Block, Cement, sharp sand, plaster sand, water,D.P.M,etc	4.1 set out and erect simple straight walls.	*Guide trainees in laying straight wall	*Block, Cement, sharp sand, plaster sand, water,D.P.M,etc
	General Objective: 5.0: Know materials and methods used in fixing openings.			General Objective: 5.0:		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
20-24	5.1 Identify Nigerian timbers and timber products suitable for window and door construction. 5.2 State the functions of openings in dwellings e.g. light, ventilation, privacy, inclusion of external	• Explain the difference between wooden shutter windows and doors, steel windows and doors, crittal-Hope type Windows and	Pictures/Posters • Charts • Door/window Schedules of a given project •Conduct visit to Aluminum company			

NVC in Block Laying and Concreting (Draft)

	<p>weather. 5.3 Describe with sketches various types of timber and metal doors and windows including their mode of operation.</p>	<p>doors. • Aluminum projected windows and sliding doors etc.</p>				
	<p>5.4 Describe various types of ironmongery and state their uses. 5.5 Explain the need for the provision of weathering structures (e.g sill) at openings and describe with sketches structures</p>					

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING

MODULE: INTRODUCTION TO BUILDING CONSTRUCTION-3

Course Code: VBC 301

Contact Hours: 2-6-8

GOAL: This module is designed to introduce the trainee in the building trades to the function and principle of roof construction ,types of finishing and installation of types of services in the building industry

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the function and principles of construction of construction of roofs
2. Understand the application of common types of finishes in the building trade
3. Understand the basic principles of installation of various types of services in dwellings.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING						
MODULE: INTRODUCTION TO BUILDING CONSTRUCTION-3			Course Code: VBC 301		CONTACT HOURS: 2-6-8	
	General Objective: 1.0 Understands the Function and Principles of Construction of Basic Roof Types.			General Objective: 1.0 Design and Construct Simple Roof for Specific Functions.		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1-6	1.1 Define and describe with sketches, basic roof types and profiles e.g. beam and slabs as in concrete flat roofs, lattice and similar guiders, trusses (Howe truss, double roof, truss rafter, standard fink French Truss, North light truss, couple, umbrella, bow string, etc), portal frames, shell roofs, folded plates etc.	<ul style="list-style-type: none"> *Describe and explain the component of roof carcassing. *Sketch roof carcassing component in details. *Give trainees assignment 	<ul style="list-style-type: none"> * Pencil *Drawing table *Set square 	1.1Design and construct a simple roof complete with carcassing component.	*Guide trainees in the design and construction of roof with the carcassing	<ul style="list-style-type: none"> -Timber -Nails Hammer,etc
6-7	1.2 Describe the materials and maximum allowable span and application of the Various roof types in 1.1. 1.3 Name and define various roof coverings suitable for tropical use and identify the areas suitable for their use in Nigeria.	<ul style="list-style-type: none"> • Show the pictorial representation of the various roof types to the student while describing each. 	<ul style="list-style-type: none"> • Pictures, Charts, Drawings, film clips 			

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Understand the types of finishes in building trade.			General Objective 2.0: Apply finishes in building.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
7-15	2.1 List external and internal wall finishes and explain their applications, e.g. paint, wall paper, premix finishes, etc. 2.2 State the function of ceiling in houses. 2.3 Describe with sketches various types of ceiling construction and ceiling finishes in the tropics e.g. normal ceiling, suspended ceiling etc. 2.4 List various types of finishes for joinery works and explain their application e.g. vanish, polish, paint etc.	<ul style="list-style-type: none"> • Guide the students. 	<ul style="list-style-type: none"> • Berger paint and other brand names, ceiling board etc, 	<ul style="list-style-type: none"> * Organize and execute the various types of finishes in the building trades. 	Demonstrate practically the application of paint	<ul style="list-style-type: none"> • Berger paint and other brand names, ceiling board etc,
	General Objective: 3.0 Know the Various Types of Installation of Services In Building.			General Objective: 3.0 Select and Install Various Types of Services in Building.		
WEEK	Specific Learning Objective	Teachers Activities	Resources	Specific Learning Objective	Teachers Activities	Resources
15-19	3.1 Explain the basic principles of a good drainage system. 3.2 Describe with sketches the installation standards relating to cold and; hot water supply.	<ul style="list-style-type: none"> • State the use of hand gloves and wearing of rubber shoes to prevent shock. 	<ul style="list-style-type: none"> • Hand gloves, shoes etc. 	3.1 Identify types of sanitary wares and fittings 3.2 Carry out jointing of sanitary fittings 3.3 Installation of sanitary wares and fittings	<ul style="list-style-type: none"> *Show trainees types of sanitary wares and fittings. *Guide trainees in jointing of sanitary fittings * Install sanitary wares in the 	Sanitary fittings -WC -sink

NVC in Block Laying and Concreting (Draft)

19-20	<p>3.3 Sanitary wares; fittings e.g. sinks, bath, W.C. shower, wash hand basin, Urinals, etc.</p> <p>3.4 Explain with sketches construction standards relating to the construction of domestic drainage system, e.g. Inspection chamber/cesspool, septic tank, soak away.</p> <p>3.5 Explain the functions of good insulation and lighting in dwellings.</p>				workshop for trainees comprehension	-bath -wash hand basin,etc
20-22	<p>3.6 Describe the different modes of supply and installation systems of electricity in dwellings e.g. simple phase, 3- phase supply (conduit or surface wiring system)</p> <p>3.7 Identify and describe various electrical fixtures stating their functions and explain their installation principles.</p>	<ul style="list-style-type: none"> • Use a detailed Electrical drawing to teach the student the key. 	<ul style="list-style-type: none"> • Electrical drawing of a typical building. 			
22-24	<p>3.8 List the precautions to be taken to ensure safe electrical installation in dwellings.</p> <p>3.9 Interpret electrical circuit symbols and drawings.</p>					

BLOCKLAYING

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING & CONCRETING

MODULE: BLOCK-LAYING 1

Course Code: VBC 111

Contact Hours: 1-9-10

GOAL: This module is designed to provide the trainee with the essential knowledge and skill that will enable him perform competently all aspects of block and brick-work in the construction industry.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the use of various tools and equipment in the block/bricklaying trade
2. Understand the basic principles of manufacture, properties and application of various types of bricks
3. Understand the use of material and basic processes in carpentry and joinery
4. Understand the principles and methods of preparing mortars for building works.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETING						
	MODULE: BRICKLAYING 1			Module Code: VBC 111	Contact Hours: 1 – 9 - 10	
	General Objective 1.0: Understand the uses of Tools and Equipment in Block /Bricklaying.			General Objective 1.0: Identify, use and maintain Block/bricklaying Equipment..		
	Specific Objective:	Teachers Activities	Resources	Specific g Objective:	Teachers Activities	Resources
1-5	<p>1.1 Differentiate between common hand tools and heavy equipment/machines used in construction trades.</p> <p>1.2 Identify the common tools and their uses.</p> <p>1.3 Identify the equipment available in Bricklaying viz pan mixer, mortar mixer, concrete mixer of various types of dumpers.</p> <p>1.4 Sketch/draw and label some of the tools/equipment used in the bricklaying shop.</p> <p>1.5 State the importance of care/ maintenance of bricklaying tools.</p> <p>1.6 Correctly handle some specified bricklaying equipment and maintain them.</p>	<p>* Distinguish by between common hand tools and equipment.</p> <p>* Display and name each tool and their uses. *</p> <p>Display charts.</p> <p>*List the operational procedure of carrying out the maintenance of specified block-laying equipment. *Ask students to identify each of these tools displayed.</p> <p>*Demonstrate the proper handling of the common bricklaying tools.</p> <p>*Carry out check for efficiency.</p> <p>*Organize a maintenance exercise of any of the equipment</p>	<ul style="list-style-type: none"> • Tools and equipment (some). • Chart/posters. • Real object tools. • Charts/Poster. • Over head projector. • Tools and equipment • Manufacturers manual 	<p>1.1 Identify the equipment used in blocklying and bricklaying trade.</p> <p>1.2 Use common tools and equipment correctly.</p> <p>1.3 Carry out routine maintenance of equipment.</p>	<p>* Guide trainees in the identification and use and maintenance of workshop and site equipment.</p>	<ul style="list-style-type: none"> * Common workshop hand tools. * Blocklaying equipment and machines on site.

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Understand the Properties and Basic Principles of Manufacture of Various Types Of Bricks.			General Objective 2.0: Produce Bricks for Specific Purposes.		
Week	Specific Objective:	Teachers Activities	Resources	Specific g Objective:	Teachers Activities	Resources
5-11	<p>2.1 List the composition of clays.</p> <p>2.2 List the physical properties of clays.</p> <p>2.3 Describe with sketches and state uses of various sizes of bricks.</p> <ul style="list-style-type: none"> • burnt clay bricks • mud bricks • engineering bricks • refractory bricks • decorative bricks • concrete bricks • sand lime bricks <p>2.4 Explain the process of manufacturing of bricks taking into account curing techniques.</p>	<p>*Displays the different types of bricks and identify the materials used in their production.</p> <p>*Use diagram to outline the process of production of standard bricks emphasizing the amount of water required in the mix and the danger of having excess or inadequate water in the mix.</p> <p>*List the advantages of machine moulded bricks over hand moulded bricks. guides the students in the production of specific number of bricks given the materials.</p> <ul style="list-style-type: none"> • Explain the defects that may occur and their remedy. 	<ul style="list-style-type: none"> • Lesson plan. • Sand-screed bricks. • Clay bricks. • Engineering bricks. • Mud bricks • Hand mould. • Machine mould. • Typical training work shop • Material laboratory • Clay • Head pan. • Spade • Moulds (manual/machine) 	<p>Mould clay/sand-screed bricks to specification</p> <p>Apply the correct curing method after production</p>	<ul style="list-style-type: none"> • Student mould clay and sand-screed bricks to specification. • Student cures the brick using the correct method. 	<ul style="list-style-type: none"> • Clay, Mould, Shovel, Water, etc. • Bucket, Rubber Host

NVC in Block Laying and Concreting (Draft)

11-12	<p>2.5 List defects in manufactured bricks.</p> <p>2.6 Explain their use causes and state necessary precautions against their occurrence.</p> <p>2.7 Estimate the required quantity of materials required for moulding or specified number of sand-screed bricks.</p> <p>2.8 List the factors which can affect the compressive strength of bricks.</p>					
<p>General Objective 3.0: Understand the Uses of Materials and Basic Processes in Carpentry and Joinery.</p>			<p>General Objective 3.0: Prepare and Use Common Carpentry and Joinery Materials.</p>			
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
12-17	<p>3.1 Identify and know various types of Nigerian timbers and state their characteristics and uses.</p> <p>3.2 Describe methods of timber conversion and preservation.</p> <p>3.3 Identify various types of manufactured boards and state their uses.</p>	<ul style="list-style-type: none"> • Teacher should bring various types of timbers (pieces) to class and identify same to students by name and characteristics. • Explain the process of timber preservatives. • Bring pieces of various types of boards e.g. plywood, particle 	<ul style="list-style-type: none"> • Pieces of various types of timbers available in Nigeria. • Wood preservatives, wood etc. • Pieces of plywood, particle board, etc. • Variety of 	Set out simple rectangular buildings on plain and on sloppy sites.	<ul style="list-style-type: none"> • Students set out rectangular building on plain and slopping sites. 	<ul style="list-style-type: none"> • Line, Tape Set Square Pegs Profiles.

NVC in Block Laying and Concreting (Draft)

	General Objective: 4.0 Understand the principles and methods of preparing mortar for const work.			General Objective: 4.0 Preparing mortar suitable for construction work.		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
17-22	4.1 Define mortar and list the qualities of a good mortar as used in construction industry. 4.2 Specify the type and mix ratio for a particular purpose. 4.3 Define workability. 4.4 Determine factors affecting workability. 4.5 Identify the advantages of mechanical mixing over manual mixing. 4.6 Determine factors affecting mixing/mix. 4.7 Determine the use of admixture in mortar.	<ul style="list-style-type: none"> • Define mortar and identify the four types of mortar and uses. a. Line mortar. b. Cement mortar c. Cement line mortar or ganged d. Mortar. e. Refectory mortar • Explain the two methods of mixing and factors affecting the choice. • Define workability, water: cement ratio, aggregate: cement ratio. 	<ul style="list-style-type: none"> • Sample of line light weight aggregate. a. sand b. binding agent c. concrete platform d. shovel e. deadpan f. pan mixer 	Select appropriate tools and equipment for ground floor construction transfer/spread level with pegs to ensure a flat surface. Specify the appropriate concrete mix Spread, tap and range green concrete to the required thickness Ram concrete appropriately Carry out construction of continuous concrete ground floor. Cure concrete by damping.	<ul style="list-style-type: none"> • Students select appropriate tools and equipment for ground floor construction. • Set up and level to specify floor level profile or edge boards around external walls. • Mark on edge board positions of internal walls. • Consolidate floor base by ramming • Establish hardcore datum pegs at suitable intervals over entire floor area. • Fill, ram and level hardcore bed to specify level. 	<ul style="list-style-type: none"> • Trowel, Spirit Level, Profiles Pegs, Nails Rammer, Hardcore dumpy level aggregates water, Mixing manually or mechanically concrete compactor surface vibrator buckets, host etc.

NVC in Block Laying and Concreting (Draft)

<p>22-24</p>	<p>4.8 Take a specified water, cement ratio, and aggregate: cement ratio, measure materials for mortar by volume.</p> <p>4.9 Mix a workable mortar for one of the following purposes.</p> <p>a. Moulding bricks b. Bedding and jointing of bricks c. Plastering and rendering</p> <p>NOTE: Mix by hand or machine process.</p>	<ul style="list-style-type: none"> • Specify by tabulating mix ratio/type of mortar for various jobs. • Describe various ways of achieving a workable mortar. • Give a mix ratio and asked student to measure out by volume the sand and cement content. 		<p>Construct solid walls of thickness ½B-1½B involving ends, junction and quoins in English and Flemish bonds</p>	<ul style="list-style-type: none"> • Establish floor level datum pegs at suitable intervals over entire floor area • Mix concrete to specification • Lay concrete to level around datum pegs. • Lay concrete on intermediate spaces to floor level and compact using tamper or surface vibrator • Cure floor by damping. • Student construct solid walls to the thickness of ½B-1½B involving ends, junctions and quoins in English bond and Flemish bond. 	<ul style="list-style-type: none"> • Bricks, Trowel, Spirit level jointing board mortar.
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NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETING

MODULE: BLOCK-LAYING/BRICKLAYING-2

Course Code: VBC 212

Contact Hours: 1 [- 9 - 10

GOAL: This module is designed to provide the trainee with the essential knowledge and skill that will enable him perform competently all aspects of block-work/brick-work in the construction industry.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the basic principles of construction and be able to construct plain and simple decorative block and brick walls
2. Know materials and methods used in fixing openings
3. Understand the basic principles of design and construction of stairs.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETING						
MODULE: BLOCK-LAYING-2			Module Code: VBC 212		Contact Hours: 1-9-10	
General Objective 1.0: Understand The Basic Principles Of Construction Of Simple Decorative Block/Brick Walls				General Objective 1.0: Construction Simple Decorative Block/Brick Walls to Specification.		
Week	Specific Objectives:	Teacher's Activities	Resources	Specific Objectives:	Teacher's Activities	Resources
1-7	1.1 State the functions of a brick wall. 1.2 Identify the common bond in brick wall construction. 1.3 Sketch different provision for future continuation of job. 1.4 Describe the following types of walls - load bearing, partition walls, parapet, party etc. 1.5 Interpret block and brickwork construction from a working drawing.	<ul style="list-style-type: none"> • The teacher list and explain the function of brick wall. • Sketch - Tooting raking back on the black board and explain their uses. • List the different types of walls and give brief definition and uses. • Explain or differentiate between pre-cast and cast in situ. 	<ul style="list-style-type: none"> • Lesson plan • Chalk board • Charts • Drawing/sketch es. 	1.1 Construct different types of bonds using blocks and bricks.	* Demonstrate, guide and supervise the students.	<ul style="list-style-type: none"> * Bricks, * blocks, * mortar, * trowel, * shovel, * head pan, * water, etc.
7-8	1.6 Describe with sketches and drawings, the following methods of bridging openings:	<ul style="list-style-type: none"> • Sketch a typical mould and form work for each. • Draw to scale 		1.2 Calculate the quantity of input or materials per square meter of block work or brickwork		

NVC in Block Laying and Concreting (Draft)

8-9	<p>1.7 Sketch the following features in wall construction.</p> <p>a. Sill</p> <p>b. Canopy, coping, attached piers detached piers.</p> <p>1.8 Estimate the quantity of material allowing for wastes using a working drawing.</p>	<p>showing construction lines and parts of a semi circle arch.</p> <ul style="list-style-type: none"> • Give assignment to draw – three centre arches. 				
9-13	<p>1.9 Define a threshold</p> <p>1.10 Sketch a threshold.</p> <p>1.11 Describe method of construction.</p> <p>1.12 Sketch fixing of door/window frames as the construction continues.</p> <p>1.13 Sketch fixing of door/window frames at the completion of construction.</p> <p>1.14 State advantages and disadvantages.</p> <p>1.15 Distinguish between pointing and jointing.</p> <p>1.16 Sketch different types used in wall construction.</p>					

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Know Materials And Methods Used In Fixing Openings.			General Objective 2.0: Apply Appropriate Materials and Procedure in Fixing Openings in Walls.		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
13-19	<p>2.1 Identify Nigerian timbers and timber products suitable for window and door construction.</p> <p>2.2 Describe the method of converting and seasoning timber for carpentry and joinery work.</p> <p>2.3 State the functions of openings in drillings e.g. light Ventilation, privacy, exclusion of external weather.</p> <p>2.4 Describer with sketches various types of timber and metal doors and windows including their mode of operation.</p> <p>2.5 Describe various types of door and window iron ironmongery and state their uses.</p> <p>2.6 Explain the need for the provision of weathering Structures (e.g sill) at openings and describe with sketches structures used in simple dwellings.</p>	<ul style="list-style-type: none"> • Explain the difference between wooden shutter windows and doors, steel windows and doors, crittal-Hope type Windows and doors. • Aluminum projected windows and sliding doors etc. 	<ul style="list-style-type: none"> • Different types of doors and windows pictures, Charts 	<p>2.1 Visit timber yard and observe, differentiate between green and seasoned timber.</p> <p>2.2 Carry out different operations in timber such as drilling, sawing, etc.</p>	<p>* Guide the students in the visit to the timber yard and the various operations on timber.</p>	<p>* Drilling machines and bits.</p>

NVC in Block Laying and Concreting (Draft)

	General Objective: 3.0 Understand the basic principles of design and construction of stairs.			General Objective: 3.0 Understand the basic principles of design and construction of stairs.		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
19-24	<p>3.1 Describe with the aid of sketches, the different types of stairs e.g. straight flight, dog-leg, open well, spiral, etc</p> <p>3.2 Explain with sketches the design standards for the construction of stairs e.g. riser-tread relationship, minimum headroom, standard sizes of structural members, etc.</p> <p>3.3 Explain the distinguishing features between stair case for domestic and commercial buildings.</p> <p>3.4 Explain the basic principles of construction of a straight flight stair-case in timber, concrete and steel.</p> <p>3.5 Design and construct a given stair case for specific purposes.</p>	<ul style="list-style-type: none"> • Differentiate between timber, concrete and steel stair cases to the student. 	<ul style="list-style-type: none"> • Pictures, Charts, Films, Timber, Stairs. 	<p>3.1 Carry out the design of timber, concrete and steel spiral stairs</p>	<ul style="list-style-type: none"> *Guide trainee in the design of various types of stairs. *Give trainee assignment on stair case designing 	<ul style="list-style-type: none"> -pencil -set square -drawing board

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING		
MODULE: BLOCKLAYING -3	Course Code: VBC 311	Contact Hours: 1-9-10
GOAL: This module is designed to provide the trainee with the essential knowledge and skill that will enable him perform competently all aspects of block work/brickwork in the construction industry.		
GENERAL OBJECTIVES: On completion of this module, the trainee should be able to:		
1.0 Understand the principles of construction, erection and dismantling of scaffolds in accordance with laid down regulations		
2.0 Know the materials and methods used in walling		
3.0 Understand the principles of construction of simple drainage system		
4.0 Understand the basic principles of laying kerbs and surface drainage		

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING						
MODULE: BLOCKLAYING -3			Module Code: VBC 311		Contact Hours: 1-9-10	
General Objective: 1.0: Understand the Principles of Erecting and Dismantling of Scaffolds.				General Objective: 1.0 Couple, Erect and Dismantle Scaffolds in Accordance with laid down Regulations		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
1-7	1.1 Describe with sketches the following scaffolds. a. bracket scaffold b. putlog c. independent d. trestle 1.2 State situation where each is most suitably used. 1.3 Identify the members. 1.4 Explain the relative advantage of timber and tubular scaffold. 1.5 Describe various hoisting equipment for hoisting material on site. a. gin wheel b. scaffold crane c. stationery crane d. mobile cranes 1.6 Identify the components and uses. 1.7 Erect a put log scaffold. 1.8 Erect transom scaffold. 1.9 Erect timber/bamboo scaffold.	<ul style="list-style-type: none"> • The teacher lists the types of scaffolds, sketch and identify their parts. • Sketch a gin wheel as it is attached to scaffold. • Sketch supports with bridle at window opening. • Identify safety precautions peculiar to scaffolding and cranes. • Show each component and name. • Show tools necessary to erect i.e. spanner wrench etc. scaffold. • Demonstrate in steps the process of erection. • Placing the sole and base plate at interval with standards. 	<ul style="list-style-type: none"> • Lesson plan • Real objects – gin wheel and chain • Pictures, posters of cranes • Couplers • Other components. • Scaffold tubes • Couplers • Spanners • Wrench etc. 	Identify specific construction work requiring the application of scaffold. Choose appropriate scaffold suitable for the construction work. Couple/erect components of steel scaffold. Construct timber/bamboo scaffold. Dismantle and store scaffold components correctly. Care and maintain scaffold components.	<ul style="list-style-type: none"> * Guide trainees through the process of selection, erection, construction, dismantling, maintenance and storage of scaffolds. 	<ul style="list-style-type: none"> * Timber, bamboo, steel pipes nails, hammer, pincers, saws, etc.,

NVC in Block Laying and Concreting (Draft)

7-8	<p>1.10 Dismantle the putlog scaffold.</p> <p>1.11 Dismantle transom scaffold.</p> <p>1.12 Dismantle timber/bamboo scaffold.</p> <p>1.13 Store scaffold materials correctly.</p>	<ul style="list-style-type: none"> • Demonstrate how a gin wheel is attached to the scaffold. 				
<p>General Objective: 2.0 Know the Materials Used for Walls and Walling.</p>				<p>General Objective: 2.0 Select, Prepare and Lay Materials for Walling Operations.</p>		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
8-12	<p>2.1 Identify by name various types of stones in Nigeria suitable for walling, i.e. granite, marble, etc;</p> <p>2.2 Describe the process involved in preparation of wall for plastering.</p> <p>2.3 Identify various bonding patterns available for walling.</p> <p>2.4 Specify mortar mix for stone setting in walling.</p>	<ul style="list-style-type: none"> • Show the students different types of stones. • In tabular form state the process involved in preparation of stone from rock. • Sketch each bonding pattern available. • Identify mix proportion of mortar for setting of stone wall. 	<ul style="list-style-type: none"> • real objects • stone samples • pictures showing <ul style="list-style-type: none"> a. blistering site b. crushing drawing showing different bonds. 	<p>2.1 Select and prepare stone materials suitable for stone pitching/facing.</p> <p>2.2 Carry out rendering operation in wall.</p> <p>2.3 Select and prepare tiling materials for wall tiling.</p>	<ul style="list-style-type: none"> * Guide the trainees in selecting, preparing and performing walling operations. 	<ul style="list-style-type: none"> * Various types of stones, tiles, mortar, cutting tools, etc.

NVC in Block Laying and Concreting (Draft)

	General Objective: 3.0 Understand the Principles of Construction Of Simple Drainage System.			General Objective: 3.0 Understand the Principles of Construction of Simple Drainage System.		
Week	Specific Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
12-15	3.1 Distinguish between a sewer and a drain. 3.2 Explain the basic principles of a good drainage system. 3.3 Sketch (1) combine system (2) separate system. 3.4 Describe with detail sketches the structural detail of: (a) septic tank; (b) soak away; (c) inspection chamber/manhole; (d) cesspool e. Intercepting chamber 3.5 Explain the use and state the standard size of. a. plastic drain pipes b. asbestos drain pipes c. galvanized steel pipes 3.6 Describe with sketches the use of pipe fitting. a. connecting sockets.	<ul style="list-style-type: none"> • Show the students pieces of drain pipes and identify their differences, advantages and disadvantages a. Plastic b. asbestos • Show the students the different pipe fitting as listed in 19.6 • Carry the students to where construction is going and show them how drains are tested 	<ul style="list-style-type: none"> • PVC and asbestos pipes • air bag and stopper • gauge • hand pump • smoke chamber • chart • picture • Water • Smoke • Ball • Torch • Air. 	3.1 Identify different types and sizes of pipes and their uses.	* Guide the trainees in identifying the specified pipes.	* pvc pipes and asbestos pipes.

NVC in Block Laying and Concreting (Draft)

15-17	<p>b. junction-square oblique c. Saddle junctions d. Bends e. Channels f. Gullies g. Drain chutes h. – interceptors 3.7 Describe with sketches the use of pipe fitting e.g. a. connecting sockets b. taper pipe c. junction-square square d. saddle junctions e. bends f. channels g. gullies h. interceptors.</p>			3.2 Dice, cut and connect different sizes of pipes and sanitary fittings	* Guide trainees to dice, cut and connect various sizes of pipes and sanitary fittings	<p>-Dicing Machine and accessories -Hack saw -Cutting machine -Filling machine</p>
17-18	<p>3.8 Describe with sketches methods of determining fall of underground drain. 3.9 Describe the following methods of testing drains. a. water b. smoke c. ball d. torch e. air</p>			3.3 Visit construction site	* Guide trainees to understand construction and testing of drains	<p>- Project site -Vehicle</p>

NVC in Block Laying and Concreting (Draft)

18-20	<p>3.10 Interpret from working drawing construction of details of simple drainage systems involving trench excavation, preparation of base, laying of pipes, gullies.</p> <p>3.11 Install (1) bath (2) wash/hand basin (3) WC suite bidet (5) urinal (6) sink.</p> <p>3.12 Explain the installation procedures of the items in 4.11 above.</p>	<ul style="list-style-type: none"> • display a typical mechanical drawing • pick detail from the drawing and explain fixing of fittings. • Using a typical standard site plan locate. <ul style="list-style-type: none"> a. soak away b. septic tank c. cesspool as the case may be 	<ul style="list-style-type: none"> • site plan • mechanical drawing • the accessories <ul style="list-style-type: none"> a. bath b. wash hand basin c. W.C. suite d. Bidet e. Urinal f. sink 	<p>3.4 Identify different types of sanitary wares.</p> <p>3.5 Select and install:</p> <ul style="list-style-type: none"> a) bath b) wash-hand basin c) w.c suite d) urinary e) sink 	<p>* Guide trainees in the installation process of sanitary wares</p>	<ul style="list-style-type: none"> * sanitary wares * sanitary pipes * pipe wrench, etc.
General Objective: 4.0 Understand the Principles of Laying Kerbs and Surface Drainage.				General Objective: 4.0 Design and Lay Kerbs and Surface Drainage System.		
Week	Specific Learning Objective:	Teachers Activities	Resources	Specific Objective:	Teachers Activities	Resources
20-24	<p>4.1 State the functions of kerbs.</p> <p>4.2 Sketch and describe different forms of kerbs and state materials for production.</p> <p>4.3 Describe with sketches methods of laying pre-cast concrete kerbs. State standard sizes of kerbs.</p> <p>4.4 Specify the quality of bricks and jointing mortar suitable for construction of channels/gutters.</p> <p>4.5 Give reasons for channels and state the factors which determine the better angles</p>	<ul style="list-style-type: none"> • Mount the pictures of a run way showing the arrangement of kerbs, pre-cast powers and channels. • List the materials used in production i.e. cement, sand and granite. 	<ul style="list-style-type: none"> • Charts • Pictures. 	<p>4.1 Undertake visit to a block making industry where kerbs are produced and study the production process.</p> <p>4.2 Visit a road construction project site to observe the process of laying kerbs.</p>	<p>* Guide trainees in the understanding f the process of laying kerbs.</p>	<ul style="list-style-type: none"> -Vehicle - block making Industry -Road Construction site

CONCRETING

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING CONCRETING		
MODULE: CONCRETING - 1	Course Code: VBC 121	Contact Hours:1-9-10
GOAL: This module is designed to provide the trainee with the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures.		
GENERAL OBJECTIVES: On completion of this module, the trainee should be able to:		
1. Understand the functions and methods of care of common concreting tools and equipment		
2. Understand the properties of aggregates in relation to their use in concrete production		
3. Know the properties and application of different types of cement		
4. Understand the use and application of stones in construction		
5. Relate the properties of concrete to its application as a construction material		
6. Understand the use and application of earth soil and laterite in construction		

1. Understand the functions and methods of care of common concreting tools and equipment
2. Understand the properties of aggregates in relation to their use in concrete production
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NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING						
MODULE: CONCRETING -1			Module Code: VBC 121		Contact Hours: 1-9-10	
General Objective 1.0: Understand the functions and methods of care for common concreting tools and equipment.				General Objective: Identify and maintain concreting tools and equipment		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
1-3	1.1 Identify and describe with sketches the concreting common hand tools and equipment eg club hammer, tapping rod, wheel barrow, head pan, mixing board, spirit level tamper. 1.2 State the functions of the tools and equipment in 1.1 1.3 State reasons for routine care and maintenance of the tools and equipment.	<ul style="list-style-type: none"> The teacher demonstrates to the students how these tools and equipment are cared for and maintained 	<ul style="list-style-type: none"> Lesson notes. Drawings, sketches of common hand tools used in block-laying work. 	1.1 Identify the basic hand tools and equipment in concreting work. 1.2 Carry out the repair and routine care and maintenance of workshop equipment	<ul style="list-style-type: none"> The teacher should guide the trainee to carry out the given test/project work to specification and supervise them adequately to obtain the results to industry standard. 	<ul style="list-style-type: none"> Wheel barrow, spirit level, head pan, club hammer etc.
General Objective 2.0: Understand the Properties of Aggregates in Relation to their Use in Concrete Production.				General Objective 2.0: Select Appropriate Aggregates for specific Concrete Production.		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
3-6	2.1 Classify aggregates as natural and artificial, and list examples under each class and state their uses. 2.2 Distinguish between the range of particles size of coarse and fine aggregates and state the factors to be considered in specification of maximum particle size for given jobs.	<ul style="list-style-type: none"> The teacher lists the natural and artificial aggregates to students e.g. natural – sand, gravel, crushed stone, etc. Artificial – foamed slag, clinker breeze, slag, saw-dust. The teacher gives examples of factors 	<ul style="list-style-type: none"> Sketches, sand gravel crushed stone saw-dust etc. 	<ul style="list-style-type: none"> Carry out the following operations as regards sieve analysis: <ol style="list-style-type: none"> aggregate sampling quartering sieving recording of results and interpretation of 	-do-	<ul style="list-style-type: none"> Sieves Aggregate Sand Gravels Granite water Measuring vessels Weighing machine

NVC in Block Laying and Concreting (Draft)

6-7	<p>2.3 State the purpose of sieve test.</p> <p>2.4 Explain the purpose of the following tests and describe methods of carrying them out:</p> <p>a. silt b. bulking c. mixture content d. colour metric e. physical tests.</p> <p>2.5 Specify the quantities of aggregates (fine and coarse) for concrete work and state reasons for the specification.</p>	<p>to include (a) dimension of concrete member to be cast. (b) cover for reinforcement (c) Ease of handling wet concrete (workability).</p>		<p>results</p> <ul style="list-style-type: none"> • Carry out the following tests on aggregates: <ul style="list-style-type: none"> a) silt test, b) bulking test, c) moisture content test, d) Colour-metric test, e) Physical test. • Record results • Interpret results 		
7-8	<p>2.6 Use the test in 2.4 to determine the quantities of given samples of aggregates.</p> <p>2.7 Describe three methods of measuring the quantity and suitability of aggregates on sites.</p> <p>2.8 Describe methods of storing and protecting aggregates on sites e.g. Stock piling, use of storage bins, rock ladder etc</p>	<ul style="list-style-type: none"> • Teacher/Student practice sieve test procedures as it involves aggregate sampling, sieving recording of results. • The teacher demonstrates the tests with the students in the school laboratory e.g. Silt them out, test colour-metric test, etc 				

NVC in Block Laying and Concreting (Draft)

	General Objective: 3.0 Know the types and properties of cements.			General Objectives: 3.0 Apply different types of cements in specific concreting work.		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
8-10	<p>3.1 List the properties and uses of the following types of cements: Ordinary Portland, Rapid hardening Portland, Sulphate resisting Portland, Portland-blast furnace, white Portland, Portland Puzzling, super sulphate cement and High alumina.</p> <p>3.2 Describe the process of manufacture of ordinary Portland cement.</p> <p>3.3 Explain the importance of the following properties of ordinary Portland cement (i) fineness (ii) Soundness (iii) Setting time.</p> <p>3.4 Define hydration and distinguish between setting and hardening of cement.</p>	<ul style="list-style-type: none"> • Carry out simple tests to determine fineness, Soundness and setting time of ordinary Portland cement. • Show a line diagram of the production process of ordinary Portland cement. • Explain the following terms <ol style="list-style-type: none"> a. hydration b. Setting and c. Hardening • Identify tests and procedures of testing i.e. fineness test, soundness, setting time etc. 	<ul style="list-style-type: none"> • Charts • Samples of raw materials e.g. lime or chalk and clay. *Chart showing the stages of production of cement; *Samples of ordinary Portland cement. *Poster of typical storage of cement in bags and silo. • Samples of the following types of cements: <ol style="list-style-type: none"> a. Low heat Portland cement, b. Sulphate resisting, etc 	<p>3.1 Carry out the following laboratory tests on cement;</p> <ol style="list-style-type: none"> a) fineness test b) setting time c) soundness 	<ul style="list-style-type: none"> • Guide trainee in carrying out the test 	<ul style="list-style-type: none"> - Samples of ordinary Portland cement. - water - clock - vicat apparatus, etc.

NVC in Block Laying and Concreting (Draft)

10-12	<p>3.5 Explain the relative advantage of handling cement in silos and in bags and state storage precautions.</p> <p>3.6 List health hazards related to cement handling and state the precaution measures against them.</p> <p>3.7 Describe three methods of assessing the quantity and suitability of ordinary Portland cement on site</p>	<ul style="list-style-type: none"> • Discuss handling procedure of both large/small quantity of cement. • Explain the physical tests on cement. • Display the equipment/apparatus for carrying out tests ie vicat apparatus etc. • Demonstrate the experiment. • Groups the students and task them to carry out the tests 	<p>a. balance</p> <p>b. apparatus ie vicat</p> <p>c. le chatelier</p> <p>d. briguette mould.</p>			
General Objective: 4.0 Know the use of stones in construction work				General Objective: 4.0 Carry out stone pitching in construction work		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
12-16	<p>4.1 Describe the various types of stones used in construction works such as, lime stone, sand stone granite, slates etc.</p> <p>4.2 Enumerate the uses of each of the stones.</p> <p>4.3 Describe the composition of the stones.</p> <p>4.4 Discuss the methods of production of these stones.</p> <p>4.5 Describe the characteristics such as</p>	<ul style="list-style-type: none"> • The teacher guides the students to make models of walls, cladding, plinths, steps, floor stairs, coping etc with stones. 	<ul style="list-style-type: none"> • Charts, various types of stones. 	<p>4.1 Identify various stones used in construction work.</p> <p>4.2 Produce stone for construction work.</p>	<ul style="list-style-type: none"> • Undertake a trip to a quarry site 	<ul style="list-style-type: none"> • Various types of stones.

NVC in Block Laying and Concreting (Draft)

	specific weights, compressive strength, water absorption, effect on fire, moisture expansion, effect of chemicals, resistance to salts, thermal expansion, conductivity, durability					
	General Objective 5.0: Understand the Properties and Characteristics of Concrete.			General Objective 5.0: Produce Concrete Components		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
16-18	<p>5.1 Define concrete and state the functions of each ingredient in concrete.</p> <p>5.2 Outline the properties that make concrete an important construction material eg mould ability, strength, durability, fire resistance etc.</p> <p>5.3 Explain the use of mass/dense and light-weight concrete in construction.</p> <p>5.4 Assess concrete terms of the following properties – Drying Shrinkage, fire resistance, thermal movement compressive and tensile strength, sound transmission permeability, creep Durability, Density.</p>	<ul style="list-style-type: none"> • The teacher and the students mix fine and coarse aggregates with cement and add water to the correct ratio to form the concrete. • Examine the mix and tell the texture, colour and also observation 	<p>a. Charts concrete.</p> <p>b. Chart</p> <p>c. Cement</p> <p>d. Sand</p> <p>e. Water</p>			

NVC in Block Laying and Concreting (Draft)

	General Objective 6.0: Know the Use Of Earth, Soil and Laterite in Construction Works.			General Objective 6.0: Apply Earth, Soil and Latrite in Construction Works.		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
18-24	6.1 Describe earth, soil and latrite. 6.2 Distinguish between earth, soil and latrite. 6.3 Discuss the various applications of soils, earth and latrite. 6.4 Enumerate the characteristics of earth soil and latrite. 6.5 Explain the problems of earth soil and latrite. 6.6 Discuss the remedies of the problems explained above. 6.7 Discuss the various field tests required to carry out on earth, soil and latrite. 6.8 Collect samples by standard methods.	<ul style="list-style-type: none"> • Demonstrate out tests on earth, soil and latrite by the following tests methods (a) Touch, washing, visual, water retention, dry strength, wet-sieving grain size etc. 	<ul style="list-style-type: none"> • Samples of earth, soil and latrite. 	6.1 Carry out tests on earth, soil and latrite by the following tests methods (a) Touch, washing, visual, water retention, dry strength, wet-sieving grain size etc.	Guide trainee on types of earth, soil and laterite testing	<ul style="list-style-type: none"> • Earth, soil, laterite, etc.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING

MODULE: CONCRETING - 2

Course Code: VBC-222

Contact Hours: 1-9-10

GOAL: This module is designed to provide the trainee with the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the principles and methods of proportioning, mixing and testing concrete and be able to carry out the operations.
2. Know the principles and methods of handling, placing and curing concrete.
3. Understand the principles and methods of constructing joints in concrete structures
4. Understand the use of form-work in construction and the principles of construction.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCKLAYING AND CONCRETING						
MODULE: CONCRETING - 2			Module Code: VBC 311		Contact Hours: 1-9-10	
General Objective: 1.0 Understands the principles and methods of proportioning, mixing and testing concrete.				General Objective: 1.0 Carry out simple operations of proportioning, mixing and testing concrete correctly.		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
1-6	<p>1.1 Distinguish between designed mix and prescribed mix and state factors to be considered in determining mix ratio e.g. Strength of finished concrete, types of concrete, structure to be cast etc.</p> <p>1.2 Define water:- cement ratio and aggregate: cement ratio and explain their relationship with the quality of mix and hardened concrete.</p> <p>1.3 Specify (a) the quality of water for mixing concrete (b) mixing ratios for a common range of jobs e.g. Strip foundation, basement floor, floor slab, lintel, concrete-roof and roof gutter, road kerbs, etc..</p>	<ul style="list-style-type: none"> • The teacher demonstrates the mixing ratios for a common range of jobs like strip foundation. • Operate and maintain a given light duty batch mixer e.g. 31/2 T mixer. • The teacher allows every student to operate the mixer under his guide. • Explain the difference between the various mixers. 	<ul style="list-style-type: none"> • Pre-cast – Slabs batch mixer charts batch mixer charts. • Charts batch mixer. 	<p>Produce good quality concrete by manual method after batching either by volume or by weight.</p> <p>Using light duty batch mixer (e.g. 3½T mixer) produce good quality concrete after batching.</p>	<p>Guide trainee in the concrete production</p>	<ul style="list-style-type: none"> • Mixing surface • Aggregates • Cement • Water • Bricklayers tools • 3½T mixer • Aggregates • Cement • Water

NVC in Block Laying and Concreting (Draft)

6-7	<p>1.4 Define batching and describe two methods of batching i.e. by volume and by weight-taking into account necessary precautions to ensure quality.</p> <p>1.5 Distinguish between the following mixers in terms of their main features, working principles and uses (a) Continuous mixer (b) batch mixer (tilting and non-tilting).</p> <p>1.6 Explain the use of the following mixers in (i) Central batch – mixing plant (ii) transit mixer, truck mixer (iii) stationary mixer. E.g. Paddle mixer).</p>					
6-7	<p>1.7 Explain methods of ensuring least variation in mix quality from a batch mixer.</p> <p>1.8 Identify common admixtures and explain their applications. Examples of admixtures may include (i) Pudlo (ii) calcium</p>	<ul style="list-style-type: none"> • Give the trainees assignment to calculate the quantity of ingredients required in any given batch with prescribed mix. • The teacher with the students carry out 				

NVC in Block Laying and Concreting (Draft)

	<p>chloride (iii) air – entraining agents; (iv) fly-ash (v) Retarders (vi) impermo etc. 1.9 Calculate the quantity of materials required for producing a specified batch using a prescribed mix.</p>	<p>slump test in the workshop. • Organize and execute mixing operations.</p>				
7-8	<p>1.10 Define workability and state factors which determine workability. 1.11 Explain the reduction in bulk of the aggregates during mixing and state the appropriate shrinkage value. 1.12 Determine workability of a given mix sample by slump test or compacting factor test 1.13 Specify the slump range for common concrete structures.</p>					

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Know the principles and methods of handling, placing and curing of concrete.			General Objective 2.0: carryout handling, placing and curing of concrete.		
Week	Specific Objectives	Teachers' Activities	Resources	Specific Objectives	Teachers' Activities	Resources
8-12	2.1 Explain the use of the following equipment in wet concrete transporting and placing operations – head pan, steel concrete barrow, power barrow, tower crane skip, mobile truck mixer conveyor belt, pipe line.	The teacher demonstrates with the students the use of the equipment in wet concrete transporting and placing operations. The teacher practices	<ul style="list-style-type: none"> • Head pan steel concrete barrow charts. • Rammer/tamper • Sketches and charts of raft, pad, strip 	2.1 Carry out concrete transportation placing and curing operations. Student should transport the already mixed concrete by any specified mode, place and cure the concrete	Guide trainee in placing and curing concrete	<ul style="list-style-type: none"> • Concrete mix • Transportation equipment • Curing materials or equipment
12-13	2.2 State the precautions (operational and safety) to be taken when using the equipment in 8.1. 2.3 Explain the use of pumped and ready-mixed concrete taking into account their relative advantages and precautions to be taken during application.	with the students the use of pumped and ready-mixed concrete. • The teacher demonstrates the use of common tools for compacting wet concrete.	foundations. <ul style="list-style-type: none"> • Lintel, beam & Column. • Floor slab, walls etc. • Cube mould. 	using appropriate materials/equipment as specified		

NVC in Block Laying and Concreting (Draft)

13-14	<p>2.4 List factors to be considered in the choice of methods of transporting wet concrete to placing point e.g. Quantity to be handled, distance to placing point, site conditions etc.</p> <p>2.5 Outline the safety and operational precautions to be observed when placing wet concrete by the methods in 2.4 above.</p> <p>2.6 State reasons for vibrating or compacting wet concrete.</p> <p>2.7 Identify common tools for compacting wet concrete and describe with sketches their main features and methods of use (compacting tools may include poker vibrators, clamp on vibrators, rammer/tamper).</p>	<ul style="list-style-type: none"> • A visit to a construction site is advised. 		<p>2.2 With the ready mixed concrete student should produce concrete biscuits.</p> <p>2.3 Cast concrete spacers for use in a given situation.</p> <p>2.4 Carry out concrete transportation, placing and curing operations by any specified mode using specified equipment.</p>		
14-15	<p>2.8 Outline safety and operational precautions in the use of mechanical vibrators.</p>	<ul style="list-style-type: none"> • Teacher demonstrates testing of cube with the students. 	<ul style="list-style-type: none"> • Sketches and charts of raft, pad, strip foundations. • Lintel, beam & column. 			

NVC in Block Laying and Concreting (Draft)

	<p>2.9 Identify appropriate compacting tools for the following concrete structures – (i) raft foundation (ii) pad foundation – (combined and Isolated) (iii) strip foundation (mass and reinforced) (iv) Lintel and bean (v) Column (vi) floor slabs (vii) walls (including parapet walls)(viii) concrete pavement (viii) concrete ground floor.</p>		<ul style="list-style-type: none"> • Floor slab, walls etc. • Charts cube mould 			
<p>14-15</p>	<p>2.10 Describe the methods of concreting under the following conditions – (a) very hot and dry weather (Severe harmattan) (b) wet weather (c) under weather. 2.11 State reasons for curing concrete and describe common curing methods eg. Pending, sprinkling, wet covering, use of water-proof paper, curing. Compounds, plastic sheets, steam curing. 2.12 Identify situations where the curing methods in 8.11 above are most suitable.</p>					

NVC in Block Laying and Concreting (Draft)

15-16	2.13 Describe the making and testing of cube taking into account precautions to be taken against variation of result. 2.14 Determine by the cube test the compressive strength of given mix sample.		Charts Cube mould			
General Objective 3.0 Understand the principles and methods of constructing joints in concrete structure.				General Objective 3.0 Constructs appropriate joints in concrete structure.		
Week	Specific Objective:	Teachers' Activities	Resources	Specific Objective:	Teachers' Activities	Resources
16-19	3.1 Explain with sketches, the purpose of the following joints in concrete structures – (a) Joints in water tanks and reservoirs (b) Construction joints (c) sliding and slip joints. 3.2 Name common jointing materials and state their specific applications Example of materials may include (a) bitumen (b) asphalt (c) corking compound (d) soft board (e) mastic etc 3.3 Describe the method of making construction joints in structures such as floors, beams, column, concrete roofs and parapets, taking	<ul style="list-style-type: none"> • The teacher sketches these joints on the chalk board and instructs the students, to draw them into their note books. • Teacher sketches expansion and contraction joints in floors, columns, concrete floors, strip and pad foundations for the students to draw. • Construct with the students, expansion, contraction, compression and 	<ul style="list-style-type: none"> • Sketches on joints in water – tanks and reservoirs etc. • Sketches showing expansion and contraction joints in floors, columns concrete roofs and strip and pad foundation. 	3.1 Carry out simple construction joints in concrete, e.g. a) Expansion//contraction joint. b) Compression joint.	Guide trainee in carrying out the types of joint	<ul style="list-style-type: none"> - Ready mix concrete. - Trowels head pans, shovels, etc.

NVC in Block Laying and Concreting (Draft)

19-20	into consideration, construction precautions. 3.4 Describe with sketches methods of constructing expansion/contraction joint in structures such as floors, columns, concrete roofs, foundation (strip and pad).	construction joints in concrete structures in the workshop.				
General Objective 4.0: Know the Use Of Formwork in Construction works.			General Objective 4.0: Place Formwork to receive Concrete.			
Week	Specific Learning Objective:	Teachers' Activities	Resources	Specific Objective:	Teachers' Activities	Resources
20-23	4.1 State the functions of formwork. 4.2 Outline the basic requirements in formwork construction e.g. adequate support, rigidity, use of appropriate materials, ease of stripping, leak-proof, repetitive use, minimum cost 4.3 Explain the relative advantages of steel and timber forms. 4.4 Explain with sketches the construction of forms for the following structures (a) Column, (b) beam and slab (c) lintel (d) concrete arch (circular, semi-circular	<ul style="list-style-type: none"> The teacher explains the functions of formwork and the basic requirements in formwork construction (1) adequate support (2) rigidity (3) Use of appropriate materials (4) Ease of stripping leak-proof repetitive use. In the workshop the teacher demonstrates to the students how soft soap solution and grease are applied to formwork. 	<ul style="list-style-type: none"> Soft soap Solution Grease 	4.1 Select appropriate formwork for specified building component. 4.2 Erect formwork in position. 4.3 Apply necessary lubricants to the form. 4.4 Place concrete in formwork properly. 4.5 Dismantle form materials	<ul style="list-style-type: none"> Demonstrate and guide students in the selection, erection and dismantling of timber and steel forms. Guide student during the placement of concrete. Supervise the students in the dismantling process of formwork. 	<ul style="list-style-type: none"> ✓ Timber and steel forms, greasing agents such as soap solution, etc.

NVC in Block Laying and Concreting (Draft)

	<p>equilateral, gothic arch) straight flight, dogleg stairs, open – well stairs window hood, concrete fascia parapet wall, road side channel or gutter.</p>					
23-24	<p>4.5 Outline the procedures and precautions to be taken in striking formwork from the structures in 10.4 above and in subsequent storage and preservation. 4.6 State the functions of mould oil and form liners and specify their qualities. Name the types of mould oil in common use and state the necessary precaution in their use, e.g. soft soap solution, grease etc.</p>					

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING CONCRETING

MODULE: CONCRETING-3

Course Code: VBC 321

Contact Hours: 1-9-10

GOAL: This module is designed to provide the trainee with the basic knowledge of the properties and application of concrete as well as the skill in the production of sound concrete structures.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Understand the basic principles and methods of reinforcing simple concrete structures.
2. Understand the basic principles and conventional methods of structural detailing.
3. Produce sound reinforced and mass concrete structures to specification.
4. Understand the basic principles of production and use of pre-stressed concrete in the construction industry

NVC in Block Laying and Concreting (Draft)

	General Objective: 1.0 Understand the principles and methods of constructing concrete structures.			General Objective: 1.0 Construct accurately given concrete structures.		
Week	Specific Learning Objective:	Teachers' Activities	Resources	Specific Learning Objective:	Teachers' Activities	Resources
1-4	<p>1.1 Explain the need for reinforcing concrete.</p> <p>1.2 Illustrate the following stress effects in concrete structures – bending, buckling, stretching, twisting, shearing.</p> <p>1.3 Illustrate the normal stress effects in the following concrete structures – (a) foundations, retaining walls, columns, beams, slab (simple supported continuous and cantilevered).</p> <p>1.4 Make sketches to show typical methods of reinforcing the following concrete structures, beams (free support beams) lintel, column, floor slab (one way and two-way span) straight flight and dog-leg stairs, roof gutter and parapet wall, road slab, retaining walls, cantilevers</p>	<ul style="list-style-type: none"> • The teacher draws on the chalk board stress effects in concrete structures on bending, buckling, stretching, twisting shearing. • After explaining them to the students, the teacher instructs them to the notes on the chalkboard into their personal notes. 	<ul style="list-style-type: none"> • Sketches, .various sizes of steel reinforcement bars 	<p>1.1 Identify different types of steel reinforcement bars</p> <p>1.2 Carry out structural detailed drawings</p>	<p>* Show trainee sizes of steel reinforcement bars</p>	<p>Various sizes of steel reinforcement bars</p> <p>Drawing sheet</p> <p>Pencil</p> <p>Drawing set</p> <p>Drawing table</p>

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Understand the basic principles and conventional methods of structural detailing.			General Objective 2.0: Show conventional detailing.in structural components.		
Week	Specific Objective:	Teachers’ Activities	Resources	Specific Objective:	Teachers’ Activities	Resources
4-8	2.1 Interpret common representation and symbols in structural drawings e.g. R,Y,X,B,T, alt, Stg, a,b,r, etc. 2.2 Illustrate with Sketches the conventional rules in structural detailing. 2.3 Illustrate the conventional methods of calling up; (a) bars eg 26 R 1011 – 200 (b) kicker (c) blinding (d) Cover. 2.4 Interpret simple structural drawings to obtain formwork construction drawings to obtain formwork construction and steel fixing details 2.5 Produce reinforcement schedules using appropriate structural detailed drawings.	<ul style="list-style-type: none"> Instructs the students to draw the conventional rules in structural detailing as shown on the chalkboard. 	<ul style="list-style-type: none"> Sketches and drawings. 	2.1 Interpret structural detailed drawings	* present structural detailed drawings to trainee	structural detailed drawings of building elements

NVC in Block Laying and Concreting (Draft)

	General Objective 3.0: Understand how to Produce Reinforced and Mass Concrete Structures to Specification.			General Objective 3.0: Produce Reinforced and Mass Concrete Structures to Specification.		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
8-13	<p>3.1 Identify common reinforcing steels and state their uses (reinforcing steels should include plain round bars, plain square bars, twisted bars, steel fabrics etc.</p> <p>3.2 Specify with reasons the qualities of reinforcing steel for concrete production.</p> <p>3.3 State reasons for the use of the following:- (a) blinding at foundation (b) hardcore (e) kicker at column base, (d) spacer block (concrete biscuits), (e) starter bars at column base.</p> <p>3.4 Describe methods of casting and curing the following in-situ concrete structures in wet or hot and dry weather (severe harmattan) conditions.</p> <p>- Strip foundation (mass and reinforced).</p> <p>- Lintels, beams, columns.</p>	<ul style="list-style-type: none"> • Demonstrate the use of common reinforcement materials like bars, steel fabrics etc in concreting with the students' participation. • Demonstrates the uses of blinding at foundation, hardcore kicker at column base spacer block and starter bars at the workshop with the students. • Organize and execute the production of in-situ reinforced concrete structures eg simple structural frames, culverts, channels and stairs. 	<ul style="list-style-type: none"> • Sketches, and short lengths of:- • Plain round bars. • Plain square bars. • Twisted Fabrics • Steel fabrics • Get some spacer blocks, starter bars kicker etc. • Charts and field-trip 	<p>3.1 Fix to specification steel reinforcement in simple concrete structures in pre-cast concrete units.</p> <p>3.2 Trainees should fix steel reinforcements in simple concrete structures e.g.</p> <p>a. Column b. Floor slab c. Parapet wall</p> <p>3.3 cast to specification the following pre-cast units.</p> <p>a. concrete blocks b. Paving slabs c. Kerbs</p> <p>Fence posts Terrazzo tiles</p>	<p>Guide trainee in fixing and production of reinforced concrete structures</p>	<ul style="list-style-type: none"> • Steel reinforcement • Simple concrete structures. • Concrete mix • Mould • Cement • Aggregates • Bricklayers' tools • Water

NVC in Block Laying and Concreting (Draft)

<p>13-16</p>	<p>- Ground and upper floors - Walls (including parapet) - Large areas eg petrol station</p> <p>3.5 Describe methods of producing the integral finishes on in-situ concrete:-</p> <p>a. exposed aggregate b. board marked surface c. screen-board damped and rolled surface</p> <p>3.6 Understand the specification of fixing steel reinforcements in simple concrete structures e.g. Column, beam, floor slab, parapet wall of simple building.</p> <p>3.8 Describe methods of producing the integral finishes on in-situ concrete:-</p>	<p>• Explain to trainees the specification of pre-cast units for the following:</p> <ul style="list-style-type: none"> • Concrete blocks • paving slabs • Kerbs • Fence posts • Terrazzo Tiles • The teacher and the students produced specified integral finish on concrete structures 				
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NVC in Block Laying and Concreting (Draft)

	a. exposed aggregate b. board marked surface c. screen-board damped and rolled surface					
	General Objective 4.0: Understand the Principles of Production and Use of Pre-stressed Concrete in the Construction Industry.			General Objective 4.0: Produce and Use Pre-stressed Concrete in the Construction Industry.		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
16-20	<p>4.1 State the advantages of pre-Stressed concrete e.g.</p> <p>a. reduced tendency to cracking b. Non-use of shear reinforcement c. Comparative to reduction in size and weight of members etc.</p> <p>4.2 Explain the meaning of pre-tensioning and post-tensioning and state their relative advantages. 4.3 State reasons for the use of the following materials in the production of pre-stressed concrete.</p> <p>a. Medium and high tensile wires or rods b. High strength concrete</p>	<ul style="list-style-type: none"> • Explain to trainees the advantages of Pre-stressed concrete and their uses. • Describe pre and post tensioning 	<ul style="list-style-type: none"> • Charts and samples of these units. 	<p>Visit a production site to have on-the-site experience production process of pre-tension and post-tension concrete.</p>	<p>4.1 Conduct site visit</p>	<p>-Vehicle - A given site</p>

NVC in Block Laying and Concreting (Draft)

20-22	<p>4.4 Describe at least one methods of producing-</p> <p>a. Pre-tensioned concrete units b. Post-tensioned concrete units.</p> <p>4.5 State with examples the use of pre-stressed concrete in the Nigerian construction scene</p> <p>4.6 State necessary safety precautions in the production of pre-stressed concrete.</p>					
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SUPERSTRUCTURE

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING CONCRETING

MODULE: SUPERSTRUCTURE -1

Course Code: VBC 131

Contact Hours: 1-9-10

GOAL: This module is designed to provide the trainee with the basic knowledge finishing materials related to the builders work and to enable him apply such finished proficiently.

GENERAL OBJECTIVES:

On completion of this module, the trainee should be able to:

1. Know the function and methods of care of finishing tools and equipment.
2. State the characteristics and application of various finishing materials
3. Understand the principles and technique of in-situ floor finishes and be able to lay specified in-situ finishes proficiently.

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETING						
Module: SUPERSTRUCTURE - 1			Module Code: VBC 131	Contact Hours: 1-9-10		
Module Specification: Theoretical				Module Specification: Practical		
General Objective: 1.0 Know the Functions and Methods of Care of Finishing Equipment				General Objective: 1.0 Perform routine Care and Maintenance of Finishing Equipment		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
1-5	<p>1.1 Identify, sketch and describe common finishing tools and equipment in the trade</p> <p>1.2 State the functions of each equipment and tool in 1.1 and precautions to be observed in their use.</p> <p>1.3 Carry out routine care and maintenance of tools in use.</p>	<ul style="list-style-type: none"> • List common finishing tools and equipment. • plastering trowel • pointing trowel • gauge rod • Frenchman • Terrazzo machine etc. • Describe the functions of each tool or equipment.. • Carry out routine care of tools and maintenance of tools in use 	<ul style="list-style-type: none"> • Lesson plan. • Tools and equipment • Charts • Pictures • plastering trowel, pointing trowel, gauge rod, Frenchman, tyrolean machine, terrazzo machine, masonry title cutter, polishing machine. 	<p>1.1 Identify and use common finishing tools and equipment in the trade.</p>	<ul style="list-style-type: none"> • Guide students to perform operation with finishing tools. 	<p>Plastering trowel, pointing trowel, gauge rod, Frenchman, Tyrolean machine terrazzo machine, masonry title cutter, polishing machine</p>

NVC in Block Laying and Concreting (Draft)

	General Objective: 2.0 Know the types and State the Characteristics of Various Finishing Materials			General Objective: 2.0 Select and apply different Finishing Materials		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
5-10	<p>2.1 Describe the various types of finishing materials in the trade taking into account their characteristics, forms of supply, methods of care and maintenance and uses. Examples may include</p> <p>a. in-situ concrete floorings; terrazzo and granolithic concrete.</p> <p>b. Clay and pre-cast finishes: bricks, ceramic tiles, mosaic tiles concrete slabs, terrazzo tiles;</p> <p>c. Stone floorings: marbles and granite</p> <p>d. Other tiles: linoleum, thermoplastic and vinyl tiles.</p> <p>e. Care and maintenance of these materials.</p>	<ul style="list-style-type: none"> • Name different types of finishing materials and • State methods of care and maintenance e.g. • in-situ concrete flooring terrazzo and granolithic concrete, • clay and pre-cast finishes, bricks, ceramic tiles, etc. • stone flooring, marble and granite • linoleum, thermoplastic, vinyl tiles. 	<ul style="list-style-type: none"> • Lesson plan • Charts • Pictures • In-situ concrete flooring • Terrazzo • Granolithic concrete, clay • Bricks • Ceramic tiles • Mosaic tiles 	2.1 Construct and fix different types of finishes to floors and walls.	Guide trainees in the construction and fixing of different types of finishes to floors and walls.	<ul style="list-style-type: none"> -marble-floor finishing machine - water - stones vibrator/tamping rammer etc • Terrazzo • Granolithic concrete, clay • Bricks • Ceramic tiles • Mosaic tiles

NVC in Block Laying and Concreting (Draft)

	General Objective 3.0: Understand the principles and techniques of application of in-situ floor finishes.			General Objective 3.0: Choose appropriate in-situ floor finishes lay specified proficiently		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
10-16	<p>3.1 Name different types of in-situ floor finishes e.g. screeds, granolithic concrete and terrazzo.</p> <p>3.2 Estimate the quantity of in-situ finishing materials from given drawings and specifications</p> <p>3.3 distinguish between the following methods of having in-situ floor finishes and explain their uses.</p> <p>a. monolithic b. bonded c. unbonded</p>	<ul style="list-style-type: none"> • List in-situ floor finishes e.g. <ul style="list-style-type: none"> • screeds • granolithic concrete • terrazzo • Calculate the amount of in-situ finishing materials from a given drawing and specification • Show the difference between <ul style="list-style-type: none"> • monolithic • bonded • unbonded, and • describe their uses 	<ul style="list-style-type: none"> • Charts, • Pictures 	<p>3.1 Organize and execute the following floor screed operations:</p> <p>3.2 Clean and wet floor area to be screed</p> <p>3.3 Mix screed to specification</p> <p>3.4 Establish screed levels (profile) at intervals over floor area</p> <p>3.5 Screed to level and float to finish using wood and steel float</p> <p>3.6 Cure screed by damping.</p> <p>3.7 Organize and execute the following terrazzo/granolithic laying operations:</p> <p>3.8 Clean floor area</p> <p>3.9 Mark out bays/patterns to specification</p> <p>3.10 Mix mortar for fixing dividing strips</p> <p>3.11 Fix dividing strips as marked out, etc.</p>	<ul style="list-style-type: none"> • Guide students to carry out floor screed operations • Clean and wet floor area. • Guide students to perform given task • Give clear specifications for students to follow. • Guide the students to carry out the operations following correct procedures. 	<p>-marble-floor finishing machine</p> <p>- water</p> <p>- stones vibrator/tamping rammer etc</p> <ul style="list-style-type: none"> • Terrazzo • Granolithic concrete, clay • Bricks • Ceramic tiles • Mosaic tiles <p>Same as above</p>

NVC in Block Laying and Concreting (Draft)

16-18	<p>3.4 Explain the causes of and state the precautions to be taken against the following defects in in-situ floor finishes (screed, terrazzo, grano).</p> <p>a. laitance b. lifting c. cracking and crazing d. dusting</p>	<ul style="list-style-type: none"> • Tabulate the causes and precautions taken to prevent defects in in-situ finishes • Laitance • Lifting • Cracking and crazing • Dusting 	- do -	<p>3.12 Mix terrazzo or grano to specification.</p> <p>3.13 Wet and grout bays to receive mix.</p> <p>3.14 Fill bays alternately with mix, compact to level using rollers or rammer and/or trowel.</p> <p>3.15 Wash off after a minimum damp-curing period of 96 hours</p>	- do -	- do -
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NVC in Block Laying and Concreting (Draft)

18-20	<p>3.5 State the functions of floor screed and specify suitable screed thickness for the following bonding methods</p> <p>a. monolithic b. unbonded c. bonded</p> <p>3.6 Specify the qualities of sand for floor screeds and state the use of various recommended screed mixes, e.g. 1:3, 1:1½, 1:4; 1:2, etc.</p> <p>3.7 Specify the properties of base suitable for laying screed, terrazzo and granolithic concrete.</p>	<ul style="list-style-type: none"> • State the thickness of <ul style="list-style-type: none"> • monolithic • unbonded • bonded • State the qualities of sand for floor screeds • State the use of various mixes in floor screed; 1:3, 1:1½; 1:4; 1:2; etc • Describe the properties suitable for laying screed. e.g. terrazzo and granolithic concrete • List the procedure procedures 	- do -	<p>3.16 Apply dust proofing agent (proprietary hardener) – terrazzo aid, and wash off thoroughly ready for polishing</p> <p>3.17 Apply terrazzo polishing machine and polish floor successively with coarse and fine abrasive stone.</p>	- do -	- do -
20-21	<p>3.8 Outline the procedures and precautions to be taken in mixing, laying, compacting, curing and protecting in-situ floor finishes (screeds, terrazzo and granolithic concrete).</p>	<p>and precautions taken in mixing</p> <ul style="list-style-type: none"> • laying • compacting • curing and protecting in-situ floor finishes 				
21-22	<p>3.9 Specify qualities of aggregates, mix proportions and thickness of granolithic and terrazzo floors for specified situation.</p>	<ul style="list-style-type: none"> • State the qualities of aggregates, mix proportion, thickness of granolithic and terrazzo floors. 				

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK MAKING CONCRETING		
MODULE: SUPERSTRUCTURE -2	Course Code: 232	Contact Hours: 1-9-10
GOAL: This module is designed to provide the trainee with the basic knowledge finishing materials related to the builders work and to enable him apply such finished proficiently.		
GENERAL OBJECTIVES: On completion of this module, the trainee should be able to:		
<ol style="list-style-type: none">1. Understand the principles and techniques of laying pre-cast floor finishes and be able to lay materials to specification2. Understand the principles and techniques of laying synthetic floor tiles and be able to lay the materials to specification3. Understand the principles and be able to organize and execute external and internal rendering.		

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK MAKING CONCRETING						
Module: SUPERSTRUCTURE -2			Module Code: VBC 232	Contact Hours 1-9-10		
Module Specification: Theoretical				Module Specification: Practical		
General Objective 1.0: Understand the principles and techniques of laying pre-cast floor finishes.				General Objective 1.0: Choose and lay appropriate pre-cast floor finishes to specification		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
1-6	<p>1.1 Specify the properties of backgrounds suitable for laying the following pre-cast materials</p> <p>a. bricks b. ceramic/clay tiles c. concrete slabs d. terrazzo slabs e. mosaic tiles</p> <p>1.2 Describe the procedures and precautions to be taken in laying the materials in 4.1</p> <p>1.3 Specify the mix and quality of the bedding mortar for each of the materials in 1.1</p> <p>1.4 Describe methods of laying floor tiles: solid bedding and separating layer methods and state their relative advantages</p>	<ul style="list-style-type: none"> • Present samples of the various pre-cast floor units for students to identify • Specify the mix and the quality of the bedding mortar for each of the various pre-cast floor units • Visit a medium sized construction site to observe the procedure of laying pre-cast floor units 	<ul style="list-style-type: none"> • Lesson notes • Sample of the following pre-cast floor units • Bricks • Ceramics • Concrete slabs terrazzo slabs • Mosaic tiles • Mortar, Water • Cleaning rag/foam 	<p>1.1 Organize and execute pre-cast floor tiling operations below:</p> <p>1.2 Solid bedding operation</p> <p>1.3 Soak and drain tile units</p> <p>1.4 Clean floor and establish floor centre</p> <p>1.5 Mix bedding mortar to specifications</p> <p>1.6 Apply bedding screed to bed and level off</p> <p>1.7 Bed tile units to level from centre outwards and clean off mortar splashes.</p>	<ul style="list-style-type: none"> - Guide trainees in the fixing of precast floor filing operations 	<ul style="list-style-type: none"> - trowel-Cutting machine - filing machine -terrazzo machine • Sample of the following pre-cast floor units • Bricks • Ceramics • Concrete slabs terrazzo slabs • Mosaic tiles • Mortar, Water • Cleaning rag/foam

NVC in Block Laying and Concreting (Draft)

6-7	1.5 Name common laying defects in pre-cast floorings (and explain their causes. Examples of defects may include: lifting, uneven surface, misalignment of tile units, cracking, etc).					
General Objective 2.0: Understand the Principles and Techniques of Laying Synthetic Floor Tiles.			General Objective 2.0: Select and Lay Synthetic Floor Tiles to Industry Standard.			
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
7-14	<p>2.1 Identify common synthetic floor tiles, state their standard sizes, and describe methods of application and maintenance.</p> <p>2.2 Estimate from working drawing the quantity of tile units required for a specified floor area.</p> <p>2.3 Specify the properties of background suitable for laying the above tiles.</p> <p>2.4 Explain the cause and state precautions against defects in PVC tiling.</p>	<ul style="list-style-type: none"> • Present the common floor tiles and let students identifies them • Estimate from working drawing the quantity of tile units required for a specified floor area • Emphasis the properties of background suitable for laying the various floor tiles 	<ul style="list-style-type: none"> • Thermoplastic tiles • Vinyl asbestos tile • P.V.C. tiles • Adhesives • Cutting knife/edge 	<p>2.1 Organize and execute the following operations in the application of synthetic floor tiles.</p> <p>2.2 Clean and dry floor as necessary</p> <p>2.3 Establish floor centre using lines and marker</p> <p>2.4 Apply adhesive according to marker's instruction at center, and bond "reference" tile.</p> <p>2.5 Apply adhesive on remaining part of floor and bond tiles from "reference" outwards</p>	Guide trainees in the application of synthetive floor tiles.	<ul style="list-style-type: none"> •Thermoplast ic tiles • Vinyl asbestos tile • P.V.C. tiles • Adhesives • Cutting knife/edge

NVC in Block Laying and Concreting (Draft)

	General Objective 3.0: Understand the Principles, Organization and Execution of External and Internal Rendering			General Objective 3.0: Execute an External and Internal Rendering Works Competently.		
Week	Specific Objective	Teachers' Activities	Resources	Specific Objective	Teachers' Activities	Resources
14-20	<p>3.1 Define rendering and state its function</p> <p>3.2 Specify the qualities of a good rendering mix and explain the function of lime and other admixtures in the mix</p> <p>3.3 Describe the following types of renderings taking into consideration materials used, based preparation, mix ratios, methods of application and curing:</p> <p>a. smooth rendering</p> <p>b. rough cast</p> <p>c. pebble dash, etc.</p> <p>3.4 Explain the problems associated with rendering of the following backgrounds and state possible remedies:</p> <p>a. sand-crete and laterite blockwork</p> <p>b. brickwork</p>	<ul style="list-style-type: none"> • Emphasis the qualities of a good rendering mix • Prepare rendering mix to specification • Describe method of applying rendering mix. • Establish levels using tie rod or wood strips 	<ul style="list-style-type: none"> • Sand-crete and laterite block work • Brickwork • Concrete Scaffolds • Tie rod or wood string Line • Admixtures • Water • Protective clothing 	<p>3.1 Organize and execute the following operations in smooth (floated finish) rendering.</p> <p>3.2 Set up necessary support platforms (scaffolds)</p> <p>3.3 Clean, wet and key wall surface, as necessary to receive mix</p> <p>3.4 Establish levels using tie rod or wood strips</p> <p>3.5 Prepare rendering mix to specifications</p> <p>3.6 Render to level and float to finish from upper level downwards Curve by wetting</p>	<ul style="list-style-type: none"> • Guide students to carry out all the activities after the teachers' demonstration 	<p>Hawking, spatter dash or chiseling; establish level using tie rod or wood strips prepare mix to specification render to level and float to finish using wood and steel float</p>

NVC in Block Laying and Concreting (Draft)

	<p>c. concrete (dense, light weight, no-fines) d. set up necessary support platforms (scaffolds) e. clean, key and wet slabs soffit as necessary.</p>			<p>3.7 Set up necessary support platform (scaffolds)</p>		
20-24				<p>3.8 Clean, key and wet slabs soffits as necessary. 3.9 Establish level using tie rod or wood strips. 3.10 Prepare mix to specification. 3.11 Render to level and float to finish using wood and steel float.</p>		

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETE WORK		
MODULE: SUPERSTRUCTURE - 3	Course Code: VBC 331	Contact Hours: 1-9-10
GOAL: This module is designed to provide the trainee with the basic knowledge finishing materials related to the builders work and to enable him apply such finished proficiently.		
GENERAL OBJECTIVES: On completion of this module, the trainee should be able to:		
<ol style="list-style-type: none">1. Understand the principles and techniques of fixing various walls and ceiling tiles and be able to fix the materials to specification.2. Understand the method of fixing and be able to fix claddings to specification under supervision3. Understand the principles and be able to apply premixed renderings.		

NVC in Block Laying and Concreting (Draft)

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK-LAYING AND CONCRETE WORK						
Module: SUPERSTRUCTURE - 3			Module Code: VBC 331		Contact Hours: 2hrs Theory, 10hrs Practical	
General Objective: 1.0: Understand principles and techniques of laying various walls and fixing ceiling tiles and be able to fix the materials				General Objective 1.0: Prepare and lay wall tiles and fixing ceiling tiles to standard.		
Week	Specific Objective:	Teachers Activities:	Resources	Specific Objective:	Teachers	Resources
1-6	<p>1.1 Outline the procedures and precautions to be taken in laying tiles/mosaics by</p> <p>a) cement mortar method</p> <p>b) adhesive method</p> <p>1.2 Estimate the quantity of wall tiles required for a specified wall area using working drawings or given data.</p> <p>1.3 Specify the properties of background suitable for fixing tiles by the methods in 1.1</p> <p>1.4 Specify the quality of sand and mix ratios for bedding and jointing mortar.</p>	<p>- Emphasis safety or healthy behavior</p> <p>- List out the procedures for fixing wall tiles.</p> <p>- Organize and execute the filing operations with the active.</p> <p>- Estimate the quantity of wall tiles required for a specified wall area using working drawings or given data.</p> <p>Participation of students.</p>	<p>- Working drawings</p> <p>- Given data</p> <p>-Cement mortar, Adhesives</p> <p>- Tiles</p> <p>- Cement powder</p> <p>-Sand</p> <p>-Mosaic</p> <p>-Protective Clothing</p>	<p>1.1 Organize and execute the following wall tiling operations</p> <p>1.2 Fix batten at width of one tile course above the concrete floor screed and level</p> <p>1.3 Soak and drain tiles in readiness for fixing</p> <p>1.4 clean, wet and provide keys in the wall, where necessary for tile fixing.</p> <p>1.5 Prepare bonding mortar to specification “butter” tiles with mortar, tap in security to wall from batten upwards keeping joints less than 2mm wide, and plumb to finish fill in joints with cement grout and clean off.</p>	<p>Guide trainee in laying wall tiles and fixing ceiling tiles</p>	<p>Cement mortar, Adhesives</p> <p>- Tiles</p> <p>- Cement powder</p> <p>-Sand</p> <p>-Mosaic</p> <p>-Protective Clothing</p>

NVC in Block Laying and Concreting (Draft)

	General Objective 2.0: Understand the method of fixing claddings			General Objective 1.0: Prepare and fix claddings to specified standard.		
Week	Specific Objective:	Teachers Activities:	Resources	Specific Objective:	Teachers	Resources
6-12	<p>2.1 Define the term “cladding” and explain its use</p> <p>2.2 Identify and state the use of various types of cramps and fixing used in securing claddings to structure e.g. channel cramps, dowel cramp, fish-tail cramp and dowel, corbel plate, rod cramps and hooks, etc.</p> <p>2.3 Name types of materials used in cladding, state the recommended slab sizes and illustrate methods of fixing them. E.g. granite, marble, slate, plastics, concrete, brick etc.</p> <p>2.4 Explain the purpose of expansion joint in claddings and describe a method of forming it.</p>	<ul style="list-style-type: none"> • Present the various types of cramps • Present the various materials used in cladding e.g. granite, plastics, marble etc. 	<ul style="list-style-type: none"> • Cramps • Granite • Marble • Slate • Plastics • Concrete • Brick • Mortar • Protective clothing. 	<p>2.1 Organize and execute cladding fixing making room for expansion joints, fill in joints with mortar and clean off..</p> <p>2.2 Prepare laying of mortar to specification</p> <p>2.3 Fix accurately specified cramps or other fixings (dowels)</p> <p>2.4 Construct expansion and compression joints in accordance with the designer’s requirement.</p>	<ul style="list-style-type: none"> • Guide the students on execution of the specified project 	<ul style="list-style-type: none"> • Cramps • Granite • Marble • Slate • Plastics • Concrete • Brick • Mortar • Protective clothing.

NVC in Block Laying and Concreting (Draft)

12-15	<p>2.5 Outline the operational and safety precautions to be observed when fixing claddings.</p> <p>2.6 specify mortar for fixing stone, concrete and granite claddings</p> <p>2.7 Explain the need for protection after fixing claddings</p> <p>2.8 Describe methods of storing and handling claddings on site.</p>	<ul style="list-style-type: none"> • Organize and execute under supervision the various operations in fixing cladding • Emphasis safety habits in handing claddings. • Illustrate the various methods of fixing cladding • Specify and prepare mortar for fixing the various claddings. 				
General Objective 3.0: Understand the principles of pre -mixed renderings				General Objective 3.0: Apply textured rendering		
Week	Specific Objective:	Teachers Activities:	Resources:	Specific Objective:	Teachers Activities	Resources
15-19	<p>3.1 Describe the composition of tyrolean and state the properties of the base suitable for its application.</p> <p>3.2 describe te method of application and cunning tyrolean</p> <p>3.3 Estimate the quantity of tyrolean required for a specified job</p>	<ul style="list-style-type: none"> • Present samples of tyrolean and sandtex to the students • Estimate the quantity of tyrolean required for a specified job. 	<ul style="list-style-type: none"> • Tyrolean • Sandtex, Water 	<p>3.1 Apply santext-trowel and santex-matt according to the marker’s instruction</p> <p>3.2 Execute the following operations in the application of tyrolean;</p>	<p>*Guide trainee in the application of sandtext and tyrolean coating</p>	<ul style="list-style-type: none"> • Tyrolean machine • cement, Sand, sandtext material Water

NVC in Block Laying and Concreting (Draft)

19-24	<p>3.4 Explain causes of failure in tyrolean finish, examples of failure may include, Peeling, discoloration, cracking and crazing, etc.</p> <p>3.5 Describe the basic composition of “santex” finish and distinguish between “santex matt” and “santex trowel” in terms of finished texture and methods of application.</p> <p>3.6 Estimate the quantity of santex finish required in a given situation.</p> <p>3.7 Describe the properties of base suitable for the application of “sandtex” finishes.</p> <p>3.8 Apply sandtex-trowel and sandtex-matt according to the marker’s instruction.</p>	<ul style="list-style-type: none"> • Give trainee assignment 		<ul style="list-style-type: none"> a. clean and wet wall surface b. prepare tyrolean to makers’ specification c. spray tyrolean evenly onto wall using tyrolean gun d. cure tyrolean by wetting 		
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SITE ORGANIZATION AND SUPERVISION

PROGRAMME: NATIONAL VOCATIONAL CERTIFICATE IN BLOCK LAYING AND CONCRETING						
MODULE: SITE ORGANISATION AND SUPERVISION			MODULE CODE: VBC 341		CONTACT HOURS: 1- 3 - 4	
COURSE SPECIFICATION: Theoretical Contents:				Practical Contents:		
General Objective: 1.0: Understand the basic principles of site and workshop organization.				General Objective: Prepare site programme of work		
WEEK	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learning Objective	Teachers Activities	Learning Resources
1	1.1 Develop methods of protecting materials, plant and components on site.	Prepare a maintenance schedule customized for the institution's workshop. Use this as a guide for students to practically maintain the equipment and tools in the workshop.	<ul style="list-style-type: none"> • Chalkboard • Chalk etc. •Institute Workshop • A given site 	* Draw up programme and progress charts for a given simple construction project (e.g. 3 bedroom bungalow).	- Select and guide trainee on a typical project	-typical project
2	1.2 Devise and use a maintenance scheme for a trade equipment, plant and machinery.					
3	1.3 Identify incentive schemes essential for the maintenance of optimal production level and standard trademanship. e.g. resources availability, labour and machine					
4	1.4 Outline the basic considerations in production planning.					

NVC in Block Laying and Concreting (Draft)

5	<p>1.5 Define the terms ‘programming’ and ‘progressing’ in relation to site work. 1.6 Outline the basic considerations in a planning and layout of company and joinery workshop.</p>	<p>Use line diagram to describe a typical workshop layout and planning.</p>	<ul style="list-style-type: none"> • Charts showing the layout 			
6	<p>1.7 Describe the procedures involved in stock order, delivery and issue in relation to a joinery workshop or building site.</p> <p>1.8 State the objectives of inventory control.</p> <p>1.9 Describe an inventory system suitable for a joinery shop.</p> <p>1.10 Distinguish between one-off, batch production</p>	<ul style="list-style-type: none"> • Explain the procedures in stock order, delivery and issue. • Make a sample of inventory control for joinery shop for the students. • Demonstrates to show the differences between one-off batch production and mass production. 	<ul style="list-style-type: none"> • Charts showing inventory control. • Templates prepared by the teacher and charts. 			

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	and mass production. 1.11 Describe the procedures in production planning, (e.g.) presentation of cutting list and materials schedule, setting out rods/templates, etc.) and their application to simple construction works.	<ul style="list-style-type: none"> • Guide students to make cutting list of a simple project 				
7-8 9	1.12 Plan a given joinery batch production project. 1.13 Explain the importance of systematic on-the-job training of the labour force and its implication on the reward system.	<ul style="list-style-type: none"> • Instruct the students to plan a joinery batch production 				
10 - 12	1.14 Outline the purpose of work study and describe some work study techniques suitable for building work. 1.15 Prepare an organization chart for a given simple construction project.	<ul style="list-style-type: none"> • Give a work study of a simple building. • Prepare an organization chart for a simple construction contract and instructs to students to copy into their notebooks 				

**Suggested List of Required Items of Equipment for
Block-laying and Concreting Programme**

S/No.	DESCRIPTION OF TOOL/EQUIPMENT
1	Brick Trowel
2	Pointing Trowel
3	Plastering Trowel
4	Spirit Level
5	Plumb Bulb
6	Builder's/Iron Square
7	Chisels
8	Chip Hammers
9	Sledge Hammer/Club Hammer
10	Lines
11	Corner Blocks
12	Floats (Wooden)
13	Hawks
14	Straight Edges
15	Spot Boards
16	Head Pans
17	Shovels
18	Spades
19	Pick Axes
20	Tape Measure (30m & 25m)
21	Rules
22	Tilting Mixer

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23	Brick and Block Moulds
24	Leveling Instrument (Dumpy Level)
25	Leveling Staff
26	Ranging Poles
27	Block-Making Machine
28	Brick-Making Machine
29	Slump Test Apparatus
30	B.S Sieves (<i>Different Sizes</i>)
34	Buckets
35	Wheel Barrows
36	Diggers
37	Terrazzo Floor Washing Machine (<i>Optional</i>)
38	Mechanical Vibrator(<i>Optional</i>)
39	Watering Can
40	Brick/Block Saws

VEI CURRICULUM DEVELOPMENT TEAM IN BLOCKLAYING AND CONCRETING

S/No	NAMES	CONTACT ADDRESS
1.	Bldr. Mujib Dora Arilesere	45 Opebi Road, Ikeja - Lagos
2.	Bkdr. Ahmed S. Abdulhamed	Dept., of Building; CES, Kaduna Polytechnic, P.M.B. 2026, Kaduna
3.	Mr Laolu Oguntuyi	Asst. Director Cooperation, Office of the Special Adviser on TVE, Ikeja –Lagos
4.	Magboma, A. Vincent	Science, Vocational & Technical Education Department, Directorate of Science, Technology, Ministry of Education, Asaba
5.	Okafor P.O.	Tertiary Education Department, TVET Branch, FME, Abuja
6.	Chigbu Azubuike	Environmental Sustainability, Thinking and Action Centre, (ESTAC), No 1 Muke, Torey Avenue, Phase 6T/Ekulu, Enugu
7.	Engr. Dr. Nuru A Yakubu, OON	Executive Secretary, NBTE Kaduna
8.	Dr. M S Abubakar	Director of Programmes NBTE, Kaduna
9.	Mal. Lawan Abdulkarim	Ag. HOD Technical Collges Division, NBTE, Kaduna
10.	E. B. Umo-Otong	NBTE, P.M.B. 2239, Kaduna
11.	Engr. A D K Muhammad	D O VEI/IEI, NBTE Kaduna
12.	Mohammed Ibrahim	NBTE, P.M.B. 2239, Kaduna