



**NATIONAL SKILLS QUALIFICATIONS**

**(NSQ)**

**FOR**

**CONSTRUCTION EQUIPMENT OPERATION**

**LEVEL TWO (2)**

**OCTOBER, 2022**

## **OVERVIEW**

This qualification is for those interested in developing a career in construction industry for the award of National Skills Qualifications (NSQ). It is aimed at producing an Operator for Construction Equipment at NSQ Level 2 with the competencies to drive, control and operate construction equipment while observing regulatory, health and safety requirements.

This qualification is subject to review after five (5) years.

## **QUALIFICATION PURPOSE**

This qualification is designed for individuals who are interested in developing a career in Construction Equipment Operations in the construction industry.

## **QUALIFICATION REQUIREMENTS**

Candidates must:

- a. Be at least 23 years of age
- b. Be medically fit
- c. Be physically fit
- d. Be mentally fit
- e. Have a valid driver's licence

Note:

This is a 25-credit unit qualification. To achieve this qualification; learners are required to achieve all mandatory units and at least one optional unit.

Each Credit is equivalent to 10 Guided Learning Hours (GLH).

There are five (5) optional units for the qualification.

## **QUALIFICATION OBJECTIVE**

At the end of the qualification, the Operator should be able to:

- a. Observe health and safety protocols
- b. Communicate effectively in workplace/worksite
- c. Relate cordially in work environment
- d. Know different types of Construction Equipment
- e. Carry out basic Maintenance of Construction Equipment
- f. Comply with relevant road and workplace regulations
- g. Drive, Control and Operate construction equipment while observing safety precautions

**Unit assessment requirements/evidence requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

***Assessment methods to be used include:***

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

## GENERAL GUIDE

<b>Unit Title</b>	Provides a clear explanation of the content of the unit.
<b>Unit Number</b>	The unique number assigned to the unit
<b>Unit Reference</b>	The unique reference number given to each unit at qualification approval by NBTE
<b>Unit Level</b>	Denotes the level of the unit within the National Skills Qualifications Framework NSQF.
<b>Unit Credit Value</b>	The value that has been given to the unit based on the expected learning time for an average learner. 1 credit = 10 learning hours
<b>Unit Purpose</b>	Provides a brief outline of the unit content.
<b>Learning Outcome</b>	A statement of what a learner will know, understand or be able to do, as a result of learning process.
<b>Assessment Criteria</b>	A description of the requirements a learner must achieve to demonstrate that a learning outcome has been met.
<b>Unit Assessment Guidance</b>	Any additional guidance provided to support the assessment of the unit.
<b>Unit Guided Learning Hours</b>	The average number of hours of supervised or directed study time or assessment required to achieve a qualification or unit of a qualification.

## Level II – Construction Equipment Operator

### MANDATORY UNITS

Unit	Unit Reference Number	Unit Title	Credit Value	Guided Learning Hour
1	CONST/CEO/001/L2	Health and Safety for Operator	2	20
2	CONST/CEO/002/L2	Communication Skills for Operator	2	20
3	CONST/CEO/003/L2	Team Work for Operator	2	20
4	CONST/CEO/004/L2	Construction Equipment	3	30
5	CONST/CEO/005/L2	Maintenance for Operator	4	40
6	CONST/CEO/006/L2	Road and Workplace Regulations	2	20
		<b>Total</b>	<b>15</b>	<b>150</b>

### OPTIONAL UNITS

7	CONST/CEO/007/L2	Excavator Operation	10	100
8	CONST/CEO/008/L2	Bulldozer Operation	10	100
9	CONST/CEO/009/L2	Grader Operation	10	100
10	CONST/CEO/010/L2	Loader Operation	10	100
11	CONST/CEO/011/L2	Concrete Truck Mixer Operation	10	100

**UNIT 001: Health and Safety for Operator**

**Unit reference number:** CONST/CEO/001/L2

**NSQ level:** 2

**Credit value:** 2

**Guided learning hours:** 20

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills required for health and safety in Construction Equipment Operation.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 001: Health and Safety for Operator**

<b>LEARNING OBJECTIVE (LO)</b>		<b>PERFORMANCE CRITERIA</b>  <b>The learner can:</b>	<b>Evidence Type</b>				<b>Evidence Ref. Page No.</b>			
<b>LO 1: Health and Safety Precaution in Workplace</b>	1.1	Describe the use of Personal Protective Equipment and wears: <ul style="list-style-type: none"> <li>• Nose mask</li> <li>• Ear muff</li> <li>• Overall</li> <li>• Hand-gloves</li> <li>• Safety boot</li> <li>• Eye goggles</li> <li>• Reflective jackets</li> <li>• Helmet</li> <li>• Fire Extinguisher</li> <li>• First Aid Box</li> <li>• Reflector Triangle (Caution Sign)</li> <li>• Caution Red Flag, etc.</li> </ul>								
	1.2	Demonstrate the use of safety equipment in 1.1 above at: <ul style="list-style-type: none"> <li>• Construction site</li> <li>• Yard</li> </ul>								
	1.3	Describe waste disposal in line with organizational procedures.								
	1.4	Maintain personal hygiene as an Operator.								
	1.5	Identify safety signs and symbols relevant to operation.								
	1.6	Select safety equipment to be used by the Operator.								
<b>LO 2:</b>	2.1	Locate potential hazard points at: <ul style="list-style-type: none"> <li>• Site</li> </ul>								



LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.					
<b>Hazard in workplace</b>		<ul style="list-style-type: none"> <li>• Yard</li> </ul>										
	2.2	Discuss causes of hazard in construction site: <ul style="list-style-type: none"> <li>• Negligence</li> <li>• Human Error</li> <li>• Machine malfunction, etc.</li> </ul>										
	2.3	Report identified hazard points to the supervisor										
	2.4	Identify possible hazard to the Operator: <ul style="list-style-type: none"> <li>• Severe weather conditions</li> <li>• Severe vibration</li> <li>• Pollution, etc.</li> </ul>										
<b>LO 3: Accident in workplace</b>	3.1	State types of accident in construction site and yard: <ul style="list-style-type: none"> <li>• Fire accident</li> <li>• Fall from height</li> <li>• Electric shock</li> <li>• Vehicular accident</li> <li>• Equipment accident, etc.</li> </ul>										
	3.2	State causes of accidents in workplace: <ul style="list-style-type: none"> <li>• Faulty equipment</li> <li>• Wrong signal from Operator Helper</li> <li>• Disregard for standard operating procedure, etc.</li> </ul>										
	3.3	State measures to prevent accident at construction										

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		site and yard as an Operator: <ul style="list-style-type: none"> <li>• Maintain alertness on the job</li> <li>• Promote safety awareness</li> <li>• Observe rest cycle</li> <li>• Use PPE, etc.</li> </ul>								
	3.4	Use firefighting equipment								
	3.5	Demonstrate First Aid at workplace.								
	3.6	Report near miss/accident to supervisor.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

**UNIT 002: Communication Skills for Operator**

**Unit reference number:** CONST/CEO/002/L2

**NSQ level:** 2

**Credit value:** 2

**Guided learning hours:** 20

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills needed to communicate effectively in the workplace.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 002: Communication Skills for Operator**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
<b>LO 1: Understand Communication in workplace</b>	1.1	Discuss communication as an Operator in construction site and yard: <ul style="list-style-type: none"> <li>• peer to peer</li> <li>• Operator Helper to Operator</li> <li>• Operator to supervisor.</li> </ul>									
	1.2	Discuss the importance of communication in a work environment.									
	1.3	Describe how to get information from schedule of work as an Operator									
<b>LO 2: Understand methods of Communication in workplace</b>	2.1	Discuss the forms of communication: <ul style="list-style-type: none"> <li>• Verbal (spoken)</li> <li>• Non-verbal (written)</li> <li>• Signs</li> <li>• Signals</li> </ul>									
	2.2	Communicate work information to Operator Helper									
	2.3	Use the following devices as an Operator to communicate information: <ul style="list-style-type: none"> <li>• Phone</li> </ul>									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Radio</li> </ul>								
<b>LO 3: Understand elements of Communication in workplace</b>	3.1	Receive written/verbal information on the job								
	3.2	Follow verbal instruction on the job								
	3.3	Pass verbal information/instruction on the job								
<b>LO4: Communicate to immediate supervisor/team members</b>	4.1	Identify circumstances that can affect progress of work such as: <ul style="list-style-type: none"> <li>• Equipment Damage</li> <li>• Safety Concerns</li> <li>• Delays that may cause inability to meet deadlines etc.</li> </ul>								
	4.2	Recognize lines of communication.								
	4.3	Report concerns which may affect work progress.								
	4.4	Record work instructions.								
	4.5	Respond to equipment dashboard signs/lights, controls and warnings.								
	4.6	Distinguish between normal and unusual grinding, hissing and screeching sounds/noise of equipment.								
	4.7	Report personal / equipment concerns to supervisor.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type	Evidence Ref. Page No.
	4.8	Record routine daily checks on equipment		

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

## **UNIT 003: Teamwork for Operator**

**Unit reference number:** CONST/CEO/003/L2

**NSQ level:** 2

**Credit value:** 2

**Guided learning hours:** 20

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills required to relate cordially in the workplace.

### **Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 003: Teamwork for Operator**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
<b>LO 1: Understand the benefits of Working in a Team at Workplace</b>	1.1	List the advantages of working as a team.									
	1.2	Describe the attributes of a team player: <ul style="list-style-type: none"> <li>• Mutual respect</li> <li>• Common goal</li> <li>• Discipline</li> <li>• Mutual understanding</li> <li>• Trust</li> <li>• Honesty and sincerity, etc.</li> </ul>									
	1.3	List members that constitute a team in the construction site: <ul style="list-style-type: none"> <li>• First Responder.</li> <li>• Administrative Staff/Security.</li> <li>• Operators.</li> <li>• Maintenance Crew, etc.</li> </ul>									
	1.4	Recognize team members in a construction site/yard.									
<b>Lo 2: Understand how to relate with team members</b>	2.1	Explain the need for good working relationship with team members at the workplace.									
	2.2	Recognize the roles of other team members.									
	2.3	Discuss your own role in achieving the objectives of the team.									
	2.4	Explain the job of an Operator at construction site.									



LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	2.5	Discuss the linkage (relationship) of the job of an Operator with other jobs in the construction operations.								
	2.6	State the importance of following work schedule as an Operator.								
<b>LO3: Positive Work Relationships with colleagues</b>	3.1	State qualities of good equipment operator: <ul style="list-style-type: none"> <li>• Love of outdoors</li> <li>• Natural aptitude for operating machines</li> <li>• Sense of balance</li> <li>• Hand-eye coordination</li> <li>• Knowledge of equipment</li> <li>• Equipment ownership</li> <li>• Attention to details</li> <li>• Communication skills, etc.</li> </ul>								
	3.2	Relate with other operators at workplace								
	3.3	Recognize construction workflow in relation to own role.								
	3.4	Communicate information that may affect other workers on the site.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

**UNIT 004: Construction Equipment**

**Unit reference number:** CONST/CEO/004/L2

**NSQ level:** 2

**Credit value:** 3

**Guided learning hours:** 30

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills of construction equipment.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 004: Construction Equipment**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 1: Understand Earthmoving Equipment in construction operation.</b>	1.1	Recognize equipment used for Earthmoving operation: <ul style="list-style-type: none"> <li>• Bulldozers</li> <li>• Excavators</li> <li>• Scrapers</li> <li>• Dumpers</li> <li>• Graders</li> <li>• Loaders</li> <li>• Tipplers, etc.</li> </ul>								
	1.2	Locate the component parts of bulldozer: <ul style="list-style-type: none"> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Track</li> <li>• Blade</li> <li>• Ripper</li> <li>• Operator Cabin</li> <li>• Track Rollers</li> <li>• Ram, etc.</li> </ul>								
	1.3	Recognize the component parts of an Excavator: <ul style="list-style-type: none"> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Bucket</li> <li>• Arm/Boom</li> <li>• Cabin</li> <li>• Tracks</li> <li>• Engine cabin, etc.</li> </ul>								
	1.4	Locate the component parts of Scraper: <ul style="list-style-type: none"> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Bucket/bowl</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Operator cabin</li> <li>• Tractor</li> <li>• Apron</li> <li>• Ejector</li> <li>• Tyres, etc.</li> </ul>								
	1.5	Recognize the component parts of Dumper: <ul style="list-style-type: none"> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Operator cabin</li> <li>• Tyres</li> <li>• Buckets, etc.</li> </ul>								
	1.6	Locate the component parts of Grader: <ul style="list-style-type: none"> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Tyres</li> <li>• Blade</li> <li>• Ripper</li> <li>• Operator Cabin, etc.</li> </ul>								
	1.7	Recognize the component parts of Tipper: <ul style="list-style-type: none"> <li>• Tyres</li> <li>• Engine system</li> <li>• Hydraulic system</li> <li>• Operator cabin</li> <li>• Bucket, etc.</li> </ul>								
	1.8	Recognize the component parts of Loader: <ul style="list-style-type: none"> <li>• Engine</li> <li>• Cabin</li> <li>• Bucket</li> <li>• Boom</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
		<ul style="list-style-type: none"> <li>• Rear counter weight</li> <li>• Tipper cylinder</li> <li>• Hydraulic system, etc.</li> </ul>									
<b>LO 2: Understand Hoisting equipment in construction operation.</b>	2.1	Identify type of cranes for hoisting operation in construction: <ul style="list-style-type: none"> <li>• Tower crane</li> <li>• Mobile crane               <ul style="list-style-type: none"> <li>- Carry deck crane</li> <li>- Rough terrain crane</li> <li>- Truck mounted crane</li> <li>- Telescopic crane</li> </ul> </li> <li>• Crawler crane</li> <li>• Floating crane</li> <li>• Fixed crane               <ul style="list-style-type: none"> <li>- Bridge/overhead crane</li> <li>- Bulk handling crane</li> <li>- Hammerhead crane, etc.</li> </ul> </li> </ul>									
	2.2	Recognize the component parts of a common mobile crane: <ul style="list-style-type: none"> <li>• Tyre</li> <li>• Outrigger stabilizer</li> <li>• Operator cabin</li> <li>• Telescopic boom</li> <li>• Elevating cylinder</li> <li>• Hook, etc.</li> </ul>									
	2.3	Explain the factors for selection of cranes for use in construction operation.									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 3: Understand compacting, laying and concreting equipment in construction operation.</b>	3.1	Identify types of equipment in compacting and laying operation in construction: <ul style="list-style-type: none"> <li>• Vibrating Roller</li> <li>• Power Rammer</li> <li>• Paver, etc.</li> </ul>								
	3.2	Recognize the component parts of a vibrating roller: <ul style="list-style-type: none"> <li>• Drum</li> <li>• Engine cabin</li> <li>• Open operation platform station</li> <li>• Tyre, etc.</li> </ul>								
	3.3	Identify the component parts of a Power Rammer: <ul style="list-style-type: none"> <li>• Guide Handle</li> <li>• Engine</li> <li>• Centre lifting point</li> <li>• Ramming shoes</li> <li>• Hammer</li> <li>• Ramming system, etc.</li> </ul>								
	3.4	Recognize the component parts of a Paver: <ul style="list-style-type: none"> <li>• Hopper</li> <li>• Tractor</li> <li>• Leveling arm</li> <li>• Spread layer</li> <li>• Tyres/tracks</li> <li>• Feeder conveyor, etc.</li> </ul>								
	3.5	Identify types of concreting equipment: <ul style="list-style-type: none"> <li>• Transit mixer truck</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
		<ul style="list-style-type: none"> <li>• Batching and mixing plant</li> <li>• Concrete pump</li> <li>• Concrete paver, etc.</li> </ul>									
	3.6	Recognize the component parts of concrete mixer truck: <ul style="list-style-type: none"> <li>• Concrete cylinder/mixing drum</li> <li>• Diesel engine</li> <li>• Control system</li> <li>• Hydraulic valve</li> <li>• Hopper</li> <li>• Water tank</li> <li>• Discharge chutes</li> <li>• Diesel tank, etc.</li> </ul>									

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>



## **UNIT 005: Maintenance for Operator**

**Unit reference number:** CONST/CEO/005/L2

**NSQ level:** 2

**Credit value:** 4

**Guided learning hours:** 40

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills to perform daily routine checks and use of Operator's log book, to prevent equipment breakdown.

### **Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 005: Maintenance for Operator**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 1: Know basic concept of maintenance</b>	1.1	Explain the meaning of maintenance								
	1.2	State the types of maintenance: <ul style="list-style-type: none"> <li>• Preventive</li> <li>• Corrective, etc.</li> </ul>								
	1.3	State the Importance of maintenance of equipment/machine.								
	1.4	Explain the effect of neglecting maintenance of equipment.								
<b>LO 2: Understand breakdown in Construction Equipment</b>	2.1	List types of breakdown/fault in construction equipment: <ul style="list-style-type: none"> <li>• Hydraulic</li> <li>• Mechanical</li> <li>• Electrical, etc.</li> </ul>								
	2.2	List types of checks to be performed in construction equipment to prevent breakdown: <ul style="list-style-type: none"> <li>• Engine oil</li> <li>• Transmission (Azolla) oil</li> <li>• Battery</li> <li>• Water</li> <li>• Brake oil</li> <li>• Track/tyre</li> <li>• Engine sound</li> <li>• Dashboard/Console</li> <li>• Functionality (wiper, head lamp, horn, brake light, reverse light etc.)</li> <li>• Hoses and cables, etc.</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	2.3	Read the following Gauges/indicators on the dashboard: <ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Transmission oil indicator</li> <li>• Battery indicator, etc.</li> </ul>								
	2.4	State the measures to prevent breakdown of construction equipment: <ul style="list-style-type: none"> <li>• Perform routine checks before operation</li> <li>• Obey warning signals</li> <li>• Avoid overworking the equipment</li> <li>• Proper parking positioning</li> <li>• Report identified faults to the appropriate unit</li> <li>• Comply with maintenance manual</li> <li>• Recommend any requirements for maintenance, etc.</li> </ul>								
<b>LO 3: Perform daily safety and maintenance checks</b>	3.1	State the importance of Operator's log book.								
	3.2	Perform checks as captured in 2.2 above in line with manufacturer's manual.								
	3.3	Show filled operator's log book.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	3.4	Report observations from checks performed in 3.2 above.								
	3.5	Service the air cleaner filter.								
	3.6	Check for loose bolts and nuts and report.								
	3.7	Adjust accelerator cable to raise and lower engine idle speed.								
	3.8	Locate grease nipple areas for lubrication.								
	3.9	Carry out lubrication using grease nipple.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

**UNIT 006: Road and Workplace Regulations**

**Unit reference number:** CONST/CEO/006/L2

**NSQ level:** 2

**Credit value:** 2

**Guided learning hours:** 20

**Unit Purpose:** This unit is designed to equip the Operator with the knowledge and attitude for compliance with relevant road and workplace regulations.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 006: Road and Workplace Regulations**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 1: Road Types</b>	1.1	List types of roads: <ul style="list-style-type: none"> <li>• Single carriage (two-lane highways)</li> <li>• Dual carriageways</li> <li>• Expressways</li> <li>• Feeder</li> <li>• Private drive pathways, etc.</li> </ul>								
	1.2	Describe road intersections <ul style="list-style-type: none"> <li>• T- junction</li> <li>• Y- junction</li> <li>• Crossroads</li> <li>• Roundabouts</li> <li>• Interchange, etc.</li> </ul>								
	1.3	Identify parts of major road <ul style="list-style-type: none"> <li>• The main road</li> <li>• Road shoulder</li> <li>• Pedestrian walkway</li> <li>• Bicycle tracks, etc.</li> </ul>								
	1.4	List classification of roads <ul style="list-style-type: none"> <li>• Federal (Trunk A)</li> <li>• State (Trunk B)</li> <li>• Metropolitan</li> <li>• Local (Trunk C), etc.</li> </ul>								
<b>LO 2 Road Signs and markings</b>	2.1	List categories of road signs: <ul style="list-style-type: none"> <li>• Regulatory (Prohibitory and Mandatory)</li> <li>• Warning/caution</li> <li>• Informative, etc.</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	2.2	Identify the features of traffic lights.								
	2.3	Explain road markings.								
	2.4	List major types of road markings: <ul style="list-style-type: none"> <li>• Edge lines</li> <li>• Solid lines</li> <li>• Broken lines</li> <li>• Zebra crossing</li> <li>• Directional arrows</li> <li>• Stop lines</li> <li>• Give way</li> <li>• Box junction, etc.</li> </ul>								
<b>LO 3: Rules of the Road</b>	3.1	Explain basic rules of the road.								
	3.2	Explain the rules of “right of way” at roundabouts.								
	3.3	State some traffic offences <ul style="list-style-type: none"> <li>• Drivers licenses violation</li> <li>• Speed violation</li> <li>• Route violation</li> <li>• Driving under influence of alcohol/drugs</li> <li>• Use of phone</li> <li>• Overloading violation</li> <li>• Light signs violation, etc.</li> </ul>								
<b>LO 4:</b>	4.1	List the road traffic regulatory documents:								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
Traffic Regulations		<ul style="list-style-type: none"> <li>• Nigeria Highway Code</li> <li>• National Road Traffic Regulation (NRTR), 2012, etc.</li> </ul>								
	4.2	List road traffic regulatory agencies <ul style="list-style-type: none"> <li>• FRSC</li> <li>• Police</li> <li>• State Traffic Regulatory Agencies</li> <li>• Vehicle inspection Officers (VIO), etc.</li> </ul>								
	4.3	State the different classes of National drivers' license.								
LO 5: Know Workplace Regulations for Personnel	5.1	Describe workplace regulations on PPE.								
	5.2	Explain workplace regulations on occupational hazards.								
	5.3	State workplace regulations on human movement on site.								
	5.4	Discuss workplace regulations on ethics and discipline.								
LO 6: Know workplace regulations for Construction Equipment	6.1	Explain workplace regulations on safe use of equipment.								
	6.2	Explain workplace regulations on movement of equipment from one location to another.								



LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	6.3	Explain workplace regulations on parking and positioning of equipment.								
	6.4	Explain workplace regulations on equipment maintenance.								
<b>Lo 7: Know workplace regulations for material handling and utilities</b>	7.1	Explain workplace regulations on material storage.								
	7.2	Explain workplace regulations on material haulage.								
	7.3	Explain workplace regulations on utilities.								
<b>Lo 8: Know workplace regulations for construction site and yard</b>	8.1	Explain workplace regulations on site/yard hoarding.								
	8.2	Explain workplace regulations on site/yard sanitation.								
	8.3	Explain workplace regulations on site/yard traffic movement.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

## **UNIT 007: Excavator Operation**

**Unit reference number:** CONST/CEO/007/L2

**NSQ level:** 2

**Credit value:** 10

**Guided learning hours:** 100

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skill to drive, control and operate wheeled and tracked Excavators while observing necessary safety precautions.

### **Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 007: Excavator Operation**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
<b>LO 1: Understand Excavators</b>	1.1	Explain excavation									
	1.2	Identify different brand of excavators: <ul style="list-style-type: none"> <li>• Caterpillar</li> <li>• Fiat Allis</li> <li>• Volvo</li> <li>• Liebherr</li> <li>• Mercedes, etc.</li> </ul>									
	1.3	Identify types of excavators: <ul style="list-style-type: none"> <li>• Wheeled</li> <li>• Crawler (Tracked) <ul style="list-style-type: none"> <li>- Dragline</li> <li>- Long reach</li> <li>- Suction</li> </ul> </li> <li>• Amphibious (Swamp), etc.</li> </ul>									
	1.4	State the functions of each excavator in 1.3 above.									
	1.5	Identify component parts of an excavator.									
	1.6	State the safety precautions involved in the use of excavators: <ul style="list-style-type: none"> <li>• Raise the bucket before movement</li> <li>• Rest the bucket on the ground to park</li> <li>• Detect underground cable using metal or cable detector, etc.</li> </ul>									
<b>LO 2:</b>	2.1	Perform external checks.									
	2.2	Climb into the cabin and adjust seat position.									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>Drive the Excavator forward and backward</b>	2.3	Fasten safety seat belt.								
	2.4	Turn on the ignition.								
	2.5	Perform cabin checks: <ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Battery indicator, etc.</li> </ul>								
	2.6	Start the excavator to idle according to specification.								
	2.7	Change control pattern to suit working position.								
	2.8	Release the lock lever.								
	2.9	Check the environment for obstruction.								
	2.10	Raise the boom.								
	2.11	Push both pedals to move smoothly forward.								
	2.12	Pull both pedals to move smoothly backward.								
2.13	Stop the excavator smoothly.									
<b>LO 3: Control the Excavator</b>	3.1	Navigate the excavator safely to the right by engaging the lever and the pedal.								
	3.2	Navigate the excavator safely to the left by engaging the lever and the pedal.								
	3.3	Use indicators as required in 3.1 and 3.2 above.								
	3.4	Maintain lane discipline while driving.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 4: Operate the Excavator</b>	4.1	Identify joysticks for various operations as specified by the manufacturer.								
	4.2	Move the joystick appropriately to raise the boom.								
	4.3	Move the joystick appropriately to lower the boom.								
	4.4	Push the joystick to appropriate position to open the bucket.								
	4.5	Push the joystick to appropriate position to close the bucket.								
	4.6	Use appropriate joystick to rotate the operator's cabin to: <ul style="list-style-type: none"> <li>• 180<sup>o</sup></li> <li>• 360<sup>o</sup></li> </ul>								
	4.7	Drive excavator with: <ul style="list-style-type: none"> <li>• Hand lever</li> <li>• Feet pedal, etc.</li> </ul>								
	4.8	Explain when to use hand levers or feet pedals to drive the excavator.								
	4.9	Adjust the cab (Operator's cabin) perfectly squared over the tracks.								
	4.10	Press appropriate joystick until the boom stops rising.								
	4.11	Adjust bucket according to work required.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	4.12	Lower the boom until bucket enters the earth/ materials to be excavated.								
	4.13	Curl and lift bucket to scoop materials to be excavated.								
	4.14	Rotate the cabin and open the bucket to drop materials excavated.								
<b>LO 5: Position and Park Excavator</b>	5.1	Position the excavator for parking procedure.								
	5.2	Rotate cabin to sit square with track facing forward.								
	5.3	Disconnect joystick controls.								
	5.4	Return the throttle down to idle.								
	5.5	Idle the engine for one minute.								
	5.6	Turn the key to shut down the excavator.								
	5.7	Explain how to load the Excavator on a low bed.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

**UNIT 008: Bulldozer Operation**

**Unit reference number:** CONST/CEO/008/L2

**NSQ level:** 2

**Credit value:** 10

**Guided learning hours:** 100

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skill to drive, control and operate Dozer while observing safety precautions.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 008: Bulldozer Operation**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 1: Understand Bulldozer (Dozer)</b>	1.1	State the use of a Dozer.								
	1.2	Identify different brand of Dozers: <ul style="list-style-type: none"> <li>• Caterpillar</li> <li>• Fiat Allis</li> <li>• Volvo</li> <li>• Liebherr</li> <li>• Komatsu, etc.</li> </ul>								
	1.3	Identify types of Dozers: <ul style="list-style-type: none"> <li>• Wheeled</li> <li>• Crawler (Tracked) <ul style="list-style-type: none"> <li>- D4D</li> <li>- D5D</li> <li>- D6D/D6N</li> <li>- D7D/D7N</li> <li>- D8K/D8N/D8R</li> <li>- D9D/D9N, etc.</li> </ul> </li> </ul>								
	1.4	State the area of application of each Dozers in 1.3 above.								
	1.5	Identify functional parts of a Dozer: <ul style="list-style-type: none"> <li>• Blade</li> <li>• Ripper</li> <li>• Cabin, etc.</li> </ul>								
	1.6	State the safety precautions involved in the use of Dozer: <ul style="list-style-type: none"> <li>• Conduct a safety check</li> <li>• Raise the blade and ripper</li> <li>• Fasten seat belt</li> </ul>								



LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Use safety rail to climb into Dozer cabin</li> <li>• Do not put the blade on the ground until you are ready to push the earth (soil), etc.</li> </ul>								
<b>LO 2: Drive the Dozer forward and backward</b>	2.1	Perform external safety checks on the Dozer.								
	2.2	Climb into the cabin and adjust seat position.								
	2.3	Fasten safety seat belt.								
	2.4	Turn on the ignition.								
	2.5	Perform cabin checks: <ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Battery indicator, etc.</li> </ul>								
	2.6	Start the Dozer to idle according to specification (warm up).								
	2.7	Turn the speed control down								
	2.8	Engage the throttle to run position.								
	2.9	Check the environment for obstruction.								
	2.10	Raise ripper and blade using the appropriate joysticks to commence movement.								
	2.11	Shift joystick forward to move the Dozer forward.								
	2.12	Shift joystick backward to reverse the Dozer.								
	2.13	State the implication of not raising the blade and the ripper before movement.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 3: Control the Dozer</b>	3.1	Move the joystick appropriate to navigate the Dozer to the right.								
	3.2	Move the joystick appropriate to navigate the Dozer to the left.								
	3.3	Use indicators as required in 3.1 and 3.2 above.								
	3.4	Maintain lane discipline while driving the Dozer.								
<b>LO 4: Operate the Dozer with the Blade</b>	4.1	Identify joysticks for various operations as specified by the manufacturer.								
	4.2	Move the joystick appropriately to raise the blade.								
	4.3	Move the joystick appropriately to lower the blade.								
	4.4	Push the joystick to appropriate position to tilt the blade.								
	4.5	Use appropriate joystick to demonstrate angling of the blade.								
	4.6	Adjust blade according to work required.								
	4.7	Apply blade to push according to work required while observing necessary safety measures.								
<b>LO 5:</b>	5.1	Identify joysticks for various operations as specified by the manufacturer.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>Operate the Dozer with the Ripper</b>	5.2	Move the joystick appropriately to raise the ripper.								
	5.3	Move the joystick appropriately to lower the ripper.								
	5.4	Push the joystick to appropriate position to tilt the ripper.								
	5.5	Adjust ripper according to work required.								
	5.6	Apply ripper to plough according to work required while observing necessary safety measures.								
<b>LO 6: Position and Park Dozer</b>	6.1	Position the Dozer for parking procedure.								
	6.2	Slowly lower the blade and ripper to ground level.								
	6.3	Disconnect joystick controls.								
	6.4	Turn the throttle to idle.								
	6.5	Move appropriate joystick to neutral position.								
	6.6	Engage the parking brake								
	6.7	Allow the engine to idle according to Dozer type specification.								
	6.8	Turn off the engine.								
6.9	Exit the Bulldozer carefully using the handrails.									

**Learners Signature:**

**Date**

Assessors Signature:

Date:

IQA Signature (if sampled)

Date:

**EQA Signature (if sampled)**

**Date:**

## **UNIT 009: Grader Operation**

**Unit reference number:** CONST/CEO/009/L2

**NSQ level:** 2

**Credit value:** 10

**Guided learning hours:** 100

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills to drive, control and operate wheeled Motor Grader while observing safety precautions.

### **Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 009: Grader Operation**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
<b>LO 1: Understand Motor Grader</b>	1.1	State the uses of Motor Grader.									
	1.2	Identify different brand of Graders: <ul style="list-style-type: none"> <li>• Caterpillar</li> <li>• Fiat Allis</li> <li>• Volvo</li> <li>• Liebherr</li> <li>• Komatsu, etc.</li> </ul>									
	1.3	Differentiate between Motor Grader and Dozer.									
	1.4	Identify types of Motor Grader: <ul style="list-style-type: none"> <li>• Small</li> <li>• Medium</li> <li>• Large</li> <li>• Rigid Frame</li> <li>• Articulated Frame, etc.</li> </ul>									
	1.5	State the area of application of each Motor Grader in 1.4 above.									
	1.6	Recognize functional parts of Grader: <ul style="list-style-type: none"> <li>• Grader Blade</li> <li>• Ripper</li> <li>• Cabin</li> <li>• Scarifier</li> <li>• Engine</li> <li>• Frame, etc.</li> </ul>									
	1.7	State the safety precautions involved in the use of Motor Grader:									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Conduct visual checks around the machine</li> <li>• Drive at slow, safe speed with the hazard lights on</li> <li>• Raise the blade and ripper when driving</li> <li>• Drop the blade and ripper on the ground when not in use</li> <li>• Look behind you while backing up, even when the backup alarm is engaged</li> <li>• Fasten seat belt, etc.</li> </ul>								
<b>LO 2: Drive the Motor Grader forward and backward</b>	2.1	Perform external safety checks on the Motor Grader.								
	2.2	Climb into the cabin and adjust seat position.								
	2.3	Fasten safety belt.								
	2.4	Turn on the ignition.								
	2.5	Perform cabin checks: <ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Battery indicator.</li> </ul>								
	2.6	Start the Motor Grader to idle according to specification (warm up).								
	2.7	Ensure that the alarm signal prompting the commencement of Grader use is observed.								
	2.8	Raise blade and ripper.								
	2.9	Engage gear for:								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Forward movement</li> <li>• Reverse movement, etc.</li> </ul>								
	2.10	Release parking brake.								
	2.11	Release the clutch gently.								
	2.12	Depress the accelerator to move off smoothly.								
	2.13	State the implication of not raising the blade and the ripper before movement.								
<b>LO 3: Control the Motor Grader</b>	3.1	Hold steering in quarter – to – three position.								
	3.2	Change gears progressively while accelerating.								
	3.3	Change gears progressively while decelerating.								
	3.4	Navigate the Motor Grader to the right.								
	3.5	Navigate the Motor Grader to the left.								
	3.6	Use indicators as required in 3.4 and 3.5 above.								
	3.7	Maintain lane discipline while driving the Motor Grader.								
	3.8	Stop Motor Grader smoothly.								
<b>LO 4: Operate the Motor Grader to perform levelling operation</b>	4.1	Identify joysticks for various operations as specified by the manufacturer.								
	4.2	Move the joystick appropriately to lower the levelling blade.								
	4.3	Move the joystick appropriately to achieve the desired depth of levelling.								



LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
	4.4	Drive the Motor Grader to commence grading operation.								
	4.5	Drive the Motor Grader to commence spreading operation.								
	4.6	Drive the Motor Grader to commence levelling operation.								
<b>LO 5: Operate the Motor Grader with the Ripper</b>	5.1	Explain the use of a ripper in the Motor Grader.								
	5.2	Identify joysticks for various operations as specified by the manufacturer.								
	5.3	Move the joystick appropriately to lower the ripper.								
	5.4	Push the joystick to appropriate position to tilt the ripper.								
	5.5	Adjust ripper according to work required.								
	5.6	Apply ripper to plough according to work required while observing safety measures.								
<b>LO 6: Position and Park Motor Grader</b>	6.1	Position the Motor Grader for parking procedures.								
	6.2	Slowly lower the blade and ripper to ground level.								
	6.3	Disconnect joystick controls.								
	6.4	Turn the throttle to idle.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
	6.5	Move appropriate joystick to neutral position.								
	6.6	Engage the parking brake.								
	6.7	Allow the engine to idle according to Motor Grader type specification.								
	6.8	Turn off the engine								
	6.9	Exit the Motor Grader carefully								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>

## **UNIT 010; Payloader Operation**

**Unit reference number:** CONST/CEO/O10/L2

**NSQ level:** 2

**Credit value:** 10

**Guided learning hours:** 100

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills to drive, control and operate the Payloader while observing safety precautions.

### **Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 010: Payloader Operation**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
<b>LO 1: Understand Payloader</b>	1.1	State the uses of Payloader.									
	1.2	Identify different brand of Payloaders: <ul style="list-style-type: none"> <li>• Caterpillar</li> <li>• Fiat Allis</li> <li>• Volvo</li> <li>• Liebherr</li> <li>• Komatsu, etc.</li> </ul>									
	1.3	Identify types of Payloader: <ul style="list-style-type: none"> <li>• Wheeled <ul style="list-style-type: none"> <li>- Backhoe</li> <li>- Skid</li> <li>- Compact Wheel Loader</li> <li>- Small Wheel Loader</li> <li>- Medium Wheel Loader</li> <li>- Large Wheel Loader</li> </ul> </li> <li>• Tracked, etc.</li> </ul>									
	1.4	Recognize component parts of a payloader: <ul style="list-style-type: none"> <li>• Bucket</li> <li>• Rocker</li> <li>• Tipper cylinder</li> <li>• Cab</li> <li>• Rear hood</li> <li>• Engine</li> <li>• Counter weight, etc.</li> </ul>									
	1.5	Identify types of Payloader buckets:									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Shovel</li> <li>• Bucket Teeth</li> <li>• General- Purpose</li> <li>• Light Material</li> <li>• Multi-Purpose Loader</li> <li>• Rock</li> <li>• Woodchip, etc.</li> </ul>								
	1.6	State the area of application of each Payloader in 1.3 above.								
	1.7	State the area of application of each bucket in 1.5 above								
	1.8	Identify functional parts of a Payloader: <ul style="list-style-type: none"> <li>• Bucket</li> <li>• Cabin</li> <li>• Frame</li> <li>• Rear Counterweight</li> <li>• Engine</li> <li>• Boom</li> <li>• Tipper Cylinder, etc.</li> </ul>								
	1.9	State the safety precautions involved in the use of Payloader: <ul style="list-style-type: none"> <li>• Conduct visual checks around the machine</li> <li>• Drive at slow, safe speed with the hazard lights on</li> <li>• Raise the bucket when driving</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>• Drop the bucket on the ground when not in use</li> <li>• Look behind you while backing up, even when the backup alarm is engaged</li> <li>• Fasten seat belt</li> <li>• Never stand beneath the raised arms, etc.</li> </ul>								
<b>LO 2: Drive the Payloader forward and backward</b>	2.1	Perform external safety checks on the Payloader								
	2.2	Climb into the cabin and adjust seat position.								
	2.3	Fasten safety belt.								
	2.4	Turn on the ignition.								
	2.5	Perform cabin checks: <ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Battery indicator, etc.</li> </ul>								
	2.6	Start the Payloader to idle according to specification (warm up).								
	2.7	Ensure that the alarm signal prompting the commencement of Payloader use is observed.								
	2.8	Raise bucket.								
	2.9	Engage gear for: <ul style="list-style-type: none"> <li>• Forward movement</li> <li>• Reverse movement, etc.</li> </ul>								
	2.10	Release parking brake.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
	2.11	Release the clutch gently.								
	2.12	Depress the accelerator to move off smoothly.								
	2.13	State the implication of not raising the bucket before movement.								
<b>LO 3: Control the Payloader</b>	3.1	Hold steering in quarter – to – three position.								
	3.2	Change gears progressively while accelerating.								
	3.3	Change gears progressively while decelerating.								
	3.4	Navigate the Payloader to the right.								
	3.5	Navigate the Payloader to the left.								
	3.6	Use indicators as required in 3.4 and 3.5 above.								
	3.7	Maintain lane discipline while driving the Payloader.								
	3.8	Stop Payloader smoothly.								
<b>LO 4: Operate the Payloader</b>	4.1	Identify joysticks for various operations as specified by the manufacturer.								
	4.2	Move the joystick appropriately to lower the bucket.								
	4.3	Move the joystick appropriately to position the bucket for use.								
	4.4	Use Payloader bucket to dig/scoop.								
	4.5	Use Payloader bucket to load materials into tipper.								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 5: Position and Park Payloader</b>	5.1	Position the Payloader for parking procedures.								
	5.2	Slowly lower the bucket to ground level.								
	5.3	Disconnect joystick controls.								
	5.4	Turn the throttle to idle.								
	5.5	Move appropriate joystick to neutral position.								
	5.6	Engage the parking brake.								
	5.7	Allow the engine to idle according to Payloader type specification.								
	5.8	Turn off the engine.								
	5.9	Exit the Payloader carefully.								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>



**UNIT 011: Concrete Mixer Truck Operation**

**Unit Reference Number:** CONST/CEO/O11/L2

**NSQ level:** 2

**Credit value:** 10

**Guided learning hours:** 100

**Unit Purpose:** This unit is designed to provide the Operator with the knowledge and skills to drive, control and operate the Concrete Mixer Truck while observing safety precautions.

**Unit Assessment Requirements/Evidence Requirements:**

Assessment must be carried out in real workplace environment in which learning and human development is carried out. Simulation is allowed in this unit and level.

Assessment methods to be used include:

1. Direct Observation (DO)
2. Question and Answer (QA)
3. Witness Testimony (WT)
4. Personal statement (PS) or Reflective Practice (RP)
5. Assignment (ASS)
6. Recognition of Prior Learning (RPL)

**UNIT 011: Concrete Mixer Truck Operation**

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
<b>LO 1: Understand Concrete Mixer Truck</b>	1.1	State the uses of Concrete Mixer Truck.								
	1.2	Identify different brands of Concrete Mixer Truck: <ul style="list-style-type: none"> <li>• Caterpillar</li> <li>• Fiat Allis</li> <li>• Volvo</li> <li>• Liebherr</li> <li>• Hamac</li> <li>• SICOMA Double shaft</li> <li>• Komatsu, etc.</li> </ul>								
	1.3	Identify different types of Concrete Mixer Truck: <ul style="list-style-type: none"> <li>• DHBT15 Concrete mixer with Pump</li> <li>• JS Series</li> <li>• MP Planetary</li> <li>• JZR Diesel driven</li> <li>• European Tech Twin Shaft, etc.</li> </ul>								
	1.4	Recognize the component parts of Concrete Mixer Truck: <ul style="list-style-type: none"> <li>• Barrel/Drum</li> <li>• Hydraulic system</li> <li>• Engine</li> <li>• Chutes pump</li> <li>• Concrete discharging chutes.</li> <li>• Water System or tank</li> <li>• Frames</li> <li>• Drum supporting rollers.</li> <li>• Control cables</li> <li>• Mudguards</li> </ul>								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.			
		<ul style="list-style-type: none"> <li>Mixing auger, etc.</li> </ul>								
	1.5	Explain potential hazards in operating Concrete Mixer Truck: <ul style="list-style-type: none"> <li>Slips, trips and falls from truck equipment.</li> <li>Mechanical (danger from moving mixer parts)</li> <li>High level of noise exposure, etc.</li> </ul>								
	1.6	State safety precautions in the use of Concrete Mixer Truck: <ul style="list-style-type: none"> <li>Ensure that the work area does not contain any hazards that may impact on the safe operation of the mixer.</li> <li>Never insert your hands into a rotating mixer bowl</li> <li>Inspect the mixer bowl regularly for consistency and suitability</li> <li>Never leave the mixer running unattended, etc.</li> </ul>								
<b>LO 2: Drive the Concrete Mixer Truck forward and backward</b>	2.1	Perform external safety checks on the Concrete Mixer Truck								
	2.2	Climb into the cabin and adjust seat position.								
	2.3	Fasten safety seat belt.								
	2.4	Turn on the ignition.								
	2.5	Perform cabin checks:								

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA  The learner can:	Evidence Type				Evidence Ref. Page No.				
		<ul style="list-style-type: none"> <li>• Fuel Gauge</li> <li>• Temperature Gauge</li> <li>• Air pressure Gauge</li> <li>• Engine oil indicator</li> <li>• Battery indicator</li> <li>• Set side mirrors, etc.</li> </ul>									
	2.6	Start the Concrete Mixer Truck to idle according to specification (warm up).									
	2.7	Ensure that the alarm signal prompting the commencement of Concrete Mixer Truck use is observed.									
	2.8	Engage gear for: <ul style="list-style-type: none"> <li>• Forward movement</li> <li>• Reverse movement, etc.</li> </ul>									
	2.9	Release parking brake.									
	2.10	Release the clutch gently.									
	2.11	Depress the accelerator to move off smoothly.									
<b>LO 3: Control the Concrete Mixer Truck</b>	3.1	Hold steering in quarter – to – three position.									
	3.2	Change gears progressively while accelerating.									
	3.3	Change gears progressively while decelerating.									
	3.4	Navigate the Concrete Mixer Truck to the right.									
	3.5	Navigate the Concrete Mixer Truck to the left.									
	3.6	Use indicators as required in 3.4 and 3.5 above.									
	3.7	Maintain lane discipline while driving the Concrete Mixer Truck.									

LEARNING OBJECTIVE (LO)		PERFORMANCE CRITERIA The learner can:	Evidence Type				Evidence Ref. Page No.			
	3.8	Stop Concrete Mixer Truck smoothly.								
<b>LO 4: Operate the Concrete Mixer Truck</b>	4.1	Identify control buttons for various operations as specified by the manufacturer.								
	4.2	Press the control button to rotate drum clockwise for feeding.								
	4.3	Press the control button to rotate drum anti-clockwise for discharge.								
	4.4	Ensure that the alarm signal indicating the completion of loading of concrete is observed								
	4.5	Drive Concrete Mixer Truck to the discharge location.								
	4.6	Press control button to set chute latch								
	4.7	Press control button for discharge of concrete								
	4.8	Flush the chute according to manufacturer's instruction								
<b>LO 5: Position and Park Concrete Mixer Truck</b>	5.1	Position the Concrete Mixer Truck for parking procedures.								
	5.2	Move the gear lever to neutral position.								
	5.3	Engage the parking brake.								
	5.4	Turn off the engine.								
	5.5	Exit the Concrete Mixer Truck carefully.								
	5.6	Carryout House Keeping								

<b>Learners Signature:</b>	<b>Date</b>
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
<b>EQA Signature (if sampled)</b>	<b>Date:</b>



**LIST OF PARTICIPANTS FOR THE ZERO DRAFT WORKSHOP FOR NATIONAL OCCUPATIONAL STANDARD (NOS) FOR  
CONSTRUCTION EQUIPMENT OPERATION HELD AT NBTE CONSULT NO. 9 KAJURU CLOSE U/RIMI GRA, KADUNA**

**FROM 11<sup>th</sup> TO 17<sup>th</sup> SEPTEMBER, 2022**

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**FROM 3<sup>RD</sup> TO 8<sup>TH</sup> OCTOBER, 2022**

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ON 23<sup>RD</sup> -26<sup>TH</sup> OCTOBER, 2022**

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