Model Curriculum

QP Name: Compactor Operator

QP Code: IES/Q0106

QP Version: 3.0

NSQF Level: 4

Model Curriculum Version: 1.0

Infrastructure Equipment Skill Council,45, Jubilee Building (Second Floor), Museum Road, Bengaluru - 560025

Table of Contents

Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Operation
Occupation	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 8342.2101
Minimum Educational Qualification and Experience	8th Grade pass with 2 year NTC plus 1 year NAC OR 10th Grade pass plus 1 year NTC/ NAC OR 10th Grade pass with 2 years of relevant experience OR 10th Grade pass and pursuing continuous schooling OR 11th Grade Pass
Pre-Requisite License or Training	Light Commercial Vehicle Driving License (LCV) is preferred
Minimum Job Entry Age	18 Years
Last Reviewed On	17/11/2022
Next Review Date	17/11/2025
NSQC Approval Date	17/11/2022
QP Version	3.0
Model Curriculum Creation Date	30/10/2022
Model Curriculum Valid Up to Date	17/11/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	420 Hours
Maximum Duration of the Course	420 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should be able to:

- Explain the compactor operation in sequence and vibration settings.
- Prepare and maintain the logbook to keep track of all actions
- Describe the instrument panel, its position, and its function.
- Explain how to record machine running hours to determine the best service plan.
- Identify common hazards and risks at site.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	4	0	0	0	4
NOS Code – IES/N 0116 NOS Name: Carry out pre-operation checks on a compactor NOS Version - 3.0 NSQF Level - 4	**30**	**30**	**60**	**0**	**120**
NOS Code – IES/N 0117 NOS Name – Operate a Compactor NOS Version - 3.0 NSQF Level - 4	**30**	**60**	**30**	**0**	**120**
NOS Code - IES/N 0118 NOS Name - Perform routine maintenance and troubleshooting of a compactor NOS Version - 3.0 NSQF Level - 4	**30**	**30**	**60**	**0**	**120**
NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 3.0 NSQF Level - 4	0	**30**	**0**	**0**	**30**
NOS Code - DST/VSQ/N0101 NOS Name - Employability Skills 30 hrs NOS Version 1.0	**0**	**30**	**0**	**0**	**30**
Total Duration	**90**	**180**	**150**	**0**	**420**

Module Details

Module 1: Orientation

Bridge Module

Terminal Outcomes:

- Describe the operations of the infrastructure industry in India.
- Elaborate the skill training schemes in Skill Sector Councils.
- Discuss the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Compactor Operator.

Duration:*<4:00>*	**Duration**:*<0:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the scope of employment opportunities in the industry • Explain the roles and responsibilities of the Compactor Operator. • Describe the different technical trainings conducted in SSC.	NIL
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster	
Tools, Equipment and Other Requirements	

Module 2: Pre-op checks on Compactor Operator

Mapped to NOS Code – IES/N0116 v 3.0

Terminal Outcomes:

- Outline the performance standards & procedures followed in the Organization.
- Explain all the typical occupational hazards and techniques to overcome them.
- Explain the responsibilities of the assigned job role.
- Describe the various types of hand signals used on the site.
- Describe the settings for the vibration system and usage during compaction.
- Prepare and maintain a logbook to keep track of all actions.

Duration: <30:00>	**Duration**: <90:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the functions of engine and transmission. • Explain the process for adding fuel and coolant to the compactor. • Describe the method to identify the grade and quality of oil to be used. • Describe the working of various controls, levers, switches, instrument panel & fuse box of the machine. • Identify various tools provided with the machine, explain their use and the importance of putting them back after use. • Explain the importance of walk around inspection of the compactor before starting it. • Explain the importance of greasing and oiling pivots and pins that require routine lubrication. • Explain the use of the Operator Handbook and Components Manual. • List typical occupational hazards and techniques for dealing with them. • Know the cost of the equipment and loss to the organization resulting from	• Demonstrate the process to examine the jobsite for loose soil, concealed deep ditches, or marshy spots where the compactor might become trapped. • Create a checklist for pre operation inspection of the equipment to detect damage, flaws, cracks or leaks. • Demonstrate how visual inspection for cracks, damage, flaws, or leaks is performed before operation. • Demonstrate the process to check the levels of oil, lubricants and fluids in the engine, transmission, radiator and brakes. • State the procedure to check the hydraulic oil level. • Illustrate the process to check fan belt tension, battery electrolyte level and tightness of the terminals. • Demonstrate the procedure to check that the greasing points are properly greased. • Inspect the parking brake, main horn, reverse horn, and headlights to ensure that they are in proper working order. • Demonstrate how to conduct visual inspection of various controls, gauges, warning lamp and other safety devices. • Identify where the tool kit is stored.

its damage and the direct/ indirect cost of accidents. • Know the recommended optimal engine oil pressure and radiator coolant temperature. • Understand the instructions, guidelines /procedures/rules related to the worksite and equipment operations. • Explain the importance of using vibratory mode during compaction; the various vibration modes and selection procedures and usage of the vibration on the mat in sequence of operation of the roller in tandem with second roller as applicable • Know the safety interlocks and their functions during start and stop of machine • Know the function of the secondary parking brake • Understand the function of hydrostatic braking system on the machine. • Explain in the detail the importance of the latest emission norms in force since 01st Oct, 2021 and the major pollutant emissions in the exhaust gas. • Explain the EATS system and the EGR system & functions of DOC, SCR, DPF, ASC.	• Illustrate the escalation matrix for reporting unresolved problems. • How to operate the roller in tandem with second compactor for wide width paving job sites. • Identify the procedure to switch on and off vibration after movement of the roller; avoid usage of vibration when roller is not moving – this is a safety procedure to be followed to prevent damage to shock mounts. • Demonstrate the selection of various Amplitude & Frequency settings on the machine and which setting to use for which lift thickness during compaction. • Know in detail the maintenance functions of the compactor; understand the importance of preventive maintenance to reduce down time. • Understand the importance of not to park on the hot section of the mat; to avoid undulations formation. • Understand the location of EATS components, Ad Blue and its role in Emission control, fill quantities and the importance of reduced Ad Blue levels leading to severe inducement on the machine leading to stoppage of work at site.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 3: Compactor operations

Mapped to NOS Code – IES/N0117 v 3.0

Terminal Outcomes:

- Perform all pre-use and on-the-job inspections.
- Plan and organize the job according to given instructions.
- Demonstrate how to adjust the machine's compaction force to ensure it is as per the compressibility of material under changing temperatures.
- Describe the instrument panel, its position and its function.

Duration:<*30*:00>	**Duration**:<90:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Classify the different types of compactors and their applications and functions. • Describe the engine and transmission as well as their use and purpose. • Explain the vibration system of the compactor. • Describe the steering techniques and the proper way to steer on a slope. • List the basic safety measures to be followed while using a compactor. • identify immediate or temporary solutions to resolve mechanical issues. • Suggest methods to avoid accidents/errors while operating Compactor.	• Demonstrate how to adjust the operator's seat, rear and side mirrors and seat belts for ease of operation. • Show how to use the ignition switch, priming pump and cold start mechanism to start the engine in extreme cold weather. • Demonstrate how to operate the tandem compactor in successive overlapping passes over surfaces to be compacted. • Show how to determine the asphalt temperature at which compaction is optimal. • Show how to ascertain that the hot mix asphalt compaction is acceptable and in conformance with organisation requirements. • Verify to ensure that the subgrade and asphalt are properly compacted and smooth. • Demonstrate how controls, levers, and switches are used to effectively operate the compactor. • Show how to assess for any damage/faulty component in the compactor and take corrective action accordingly
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	

Tools, Equipment and Other Requirements
Safety Gear, Tool Kit, PPE

Module 4: Routine maintenance and simple trouble shooting

Mapped to NOS Code: IES/N0118 v 3.0

- Demonstrate how to keep note of machine running hours to determine the best service plan.
- Explain the importance of grease all greasing pins and pivot points every day.
- Follow the reporting procedures established by the employer.
- Explain all the typical occupational hazards and techniques to overcome them.

Duration: <30:00>	**Duration**: <90:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define safety protocols to be observed before undertaking any repair. • Explain the consequences of process delays in repairing the compactor. • Outline the performance standards & procedures followed in the company. • Elaborate the fundamental mechanical system at work in the different operations of the of the compactor. • Illustrate the use of control and switches needed to operate the compactor appropriately. • Explain importance of the optimal levels of control indicators like fuel gauge, engine oil pressure and temperature. • Identify the potential causes of any unusual noises coming from the engine. • Define the escalation matrix for reporting unresolved problems.	• Create daily / weekly maintenance sheets in conformance with organization recommendation and machine running hours. • Demonstrate how to check and top up coolants, lubricants and fluids in conformance with manufacturer's specifications. • Show how to oil the greasing pins and pivot points. • Employ suitable process to check battery electrolyte levels and condition of the terminals. • Show how to clean the air filter dust bowls and check that the gasket and inner filter are in good condition. • Demonstrate the procedure to check and maintain the tyre rims, air pressure, wheel nuts and treads according to the manufacturer's recommendations.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	

Safety Gear, Tool Kit, PPE

Module 5: Health and safety

Mapped to NOS Code: IES/N 7601 v3.0

Terminal Outcomes:

- Describe the guidelines for health, safety and security requirements.
- Identify common hazards and risks at site
- Employ safe practices to use the tools and machines.
- Explain emergency procedure to stop and shutdown machinery.
- Carry out basic first-aid treatment for common injuries.
- Demonstrate the operation of firefighting equipment.
- Elaborate the procedure for storage and disposal of hazardous materials and waste.
- Describe various safety signs, symbols and warnings used in workplace.

Duration: <10:00>	**Duration**: <20:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the Health, safety, environmental (HSE) policies. • Explain the reporting procedure for all HSE activities. • List down the contact details of HSE personnel, in case of emergencies. • Explain safe working practices to avoid common hazards and risks. • Report all health and safety related incidents/accidents. • Classify waste based on non-recyclable, hazardous and recyclable material.	• Show the correct use of Personal Protective Equipment (PPE). • Demonstrate the operation of fire extinguishers. • Demonstrate the procedure to give basic first aid. • Prepare hazard log register and report incidents and accidents. • Conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate safe storage and disposal of waste.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, marker and duster	
Tools, Equipment and Other Requirements	
Fire Extinguishers, Personal Protective Equipment and other safety gears	

Module 6: Employability Skills

Mapped to NOS: DST/VSQ/N0101

Terminal Outcomes:
At the end of this module, the learner should have acquired the listed knowledge and skills.

- Discuss the importance of Employability Skills in meeting the job requirements
- Show how to practice different environmentally sustainable practices
- Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations
- Demonstrate how to communicate in a well -mannered way with others
- Demonstrate working with others in a team
- Show how to conduct oneself appropriately with all genders and PwD
- Discuss the significance of reporting sexual harassment issues in time
- Discuss the significance of using financial products and services safely and securely
- Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws
- Show how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely
- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Explain the significance of identifying customer needs and addressing them
- Create a biodata
- Use various sources to search and apply for jobs
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities
- Describe opportunities as an entrepreneur

Duration: <00:00>	Duration: <30:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• NA	• Discuss the importance of Employability Skills in meeting the job requirements • Show how to practice different environmentally sustainable practices • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely • Explain the significance of identifying customer needs and addressing them • Create a biodata • Use various sources to search and apply for jobs • Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Describe opportunities as an entrepreneur
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, marker, duster	
Tools, Equipment and Other Requirements	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
CLASS VIII		**3**	**2**	**1**		

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: Compactor Operator Mapped to QP: IES/Q0106 Version3.0. Minimum accepted score 70%.	Certified for Job Role: Compactor Operator Minimum accepted score 70%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Class VIII		**3**	**2**	**1**		

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: Compactor Operator Mapped to QP: IES/Q0106–Version3.0 Minimum accepted score 70%.	Certified for Job Role: Compactor Operator Minimum accepted score 70%.

Assessment Strategy

Criteria for assessment for Qualification Pack have been laid down based on the NOS's.

Each Performance Criteria (PC) has been assigned marks proportional to its importance within NOS and weightages have also been given among the NOSs accordingly.

The assessment of the theory/knowledge will be based on written test/viva or both while skill test shall be hands on practical.

Behavior and attitude will be assessed while performing the assigned task.

The assessment shall be done as per the guidelines formulated by IESC.

The assessment agencies in consultation with IESC will create unique question papers for theory/knowledge and practical skills at each IESC accredited testing centers (as per assessment criteria below)

To pass the Qualification Pack, every trainee should score a minimum of 70%.

In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification pack.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module**.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
QRC	Qualification Review Committee
SSC	Sector Skill Council
SDMS	Skill Development Management System
SIP	Skill India Portal
HSE	Health Safety Environment
PPE	Personal Protective Equipment
PwD	Persons with disabilities