



Model Curriculum

QP Name: Concrete Pump Operator

QP Code: IES/Q0107

QP Version: 3.0

NSQF Level: 4.0

Model Curriculum Version: 1.0

Infrastructure Equipment Skill Council (IESC), Jubilee Building (Second Floor), No.45, Museum Road, Bengaluru - 560025



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Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Operation
Occupation	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8114.0300
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 roles and responsibilities of the concrete pump Operator.
- Describe the controls, levers and switches in order to operate the concrete pump properly.
- Explain the working of engine, transmission, their use and function.
- Outline the techniques for avoiding a blockage in a concrete pump
- Assist in concrete pump maintenance on a scheduled basis.
- Understand all the typical occupational hazards and techniques to be overcome.
- Demonstrate the procedure to carry out all pre-use and running checks.
- Describe the guidelines for health, safety and security requirements.
- Prepare and maintain the logbook to keep track of all actions

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 0119 NOS Name: Carry out pre-operation checks on a concrete pump NOS Version - 2.0 NSQF Level - 4	30	30	60	0	120
NOS Code – IES/N 0120 NOS Name – Operate a concrete pump NOS Version - 2.0 NSQF Level - 4	30	60	30	0	120
NOS Code - IES/N 0121 NOS Name - Perform routine maintenance and troubleshooting of a concrete pump NOS Version - 2.0 NSQF Level - 4	30	30	60	0	120
NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 2.0 NSQF Level – 4		30	0	0	30
NOS Code - DST/VSQ/N0101	0	30	0	0	30

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NOS Name - Employability Skills 30 hrs					
NOS Version- 1.0					
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.
- Outline the skill training schemes in the Skill Sector Councils.
- Discuss the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Concrete Pump Operator.
- Discuss the different types of job roles available in IESC.

Duration:<4:00>	Duration:<0:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the scope of employment opportunities in the industry. • Explain the roles and responsibilities of concrete pump 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 Concrete Pump

Mapped to NOS Code – IES/N0119 v 2.0

Terminal Outcomes:

- Classify the different types of concrete pumps and their applications and functions.
- Explain the procedure to deal with common hazards in the work area.
- Conduct the visual checks to identify damage, defects, cracks or leaks beforehand.
- Communicate to adhere time limits given by supervisor.
- Create prescribed formats and record maintenance logbook to record all activities performed before starting the concrete pump.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Know about the different types of concrete pumps and their applications and functions. • Introduction to the working of engine, gear box, transmission, hydraulic system, their uses and functions. • Outline the performance standards, procedures and reporting structure followed in the organization. • Know the relevance of lubricating and oiling concrete pump components that require routine Lubrication. • Elucidate the technique for determining the grade and quality of the oil to be utilized. • Illustrate the use of controls, levers, and switches in order to effectively operate the concrete pump. • Know job-specific documentation, such as a daily maintenance checklist and the significance of the same. 	<ul style="list-style-type: none"> • Conduct a visual inspection of the body and components for cracks and leaks. • Ensure that all switches are in neutral before starting the pump. • Conduct a visual inspection of the different controls, gauges, warning bulb, emergency button and other safety measures to ensure that they are in working order. • Check and top up the radiator coolant and the oil levels in the engine, transmission, brake, differential and hydraulic tank in accordance with the manufacturer's specifications. • Examine the transfer tubes/rock valve/gate valve/s, for wear and tear and if necessary, adjust the sealing gap. • Clean the air filter dust and ensure that the gasket of the inner filter fits tightly. • Demonstrate how to check the water level and contamination in the water tank.

<ul style="list-style-type: none">• List common hazards in the work area and procedures to deal with them.• Know the safety policy of the company.• Know the schedule for resolving complaints and the escalation matrix for reporting unresolved problems.	<ul style="list-style-type: none">• Ensure that all lubrication pins and pivot points are properly lubricated.• Display all necessary work signs as required.• Make a logbook to record all activities performed before starting the concrete pump.
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: Concrete Pump Operations

Mapped to NOS Code – IES/N0120 v 2.0

Terminal Outcomes:

- Explain the procedure to deal with common hazards in the work area.
- Summarize the company's performance criteria and processes.
- Explain the working of engine, transmission, their use and function.
- Elucidate the operation of a transit mixer and a concrete pump function.
- Assist in performing all pre-use and on-the-job inspections.
- Organize the plan accordingly to effectively manage the concrete flow to meet the project's requirements.

Duration:<30:00>	Duration:<90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Read instructions, guidelines /procedures/rules related to the worksite and concrete pump operations. • Describe the concrete pump's characteristics. • Explain the operation of a transit mixer. • Explain how a transit mixer and a concrete pump function. • Know the cost of the concrete pump and loss to the Organization resulting from its damage and the direct/ indirect cost of accidents. • Outline how to plan work according to the required schedule and location. • Know the work target, performance criteria and mechanism for review by the supervisor. • Explain the dangers and consequences of failing to follow clearly specified procedures/work instructions. • Identify the tools in the tool kit, explain their use and know their place of storage. • Explain why it is necessary to go around the concrete pump before starting it. • Outline the interconnections and 	<ul style="list-style-type: none"> • Plan and carry out the work in accordance with the supervisor's instructions. • Verify the integrity of the pipelines linked to pumps and truck mixers prior to concrete transfer. • Demonstrate the process of using hand tools and industry-standard equipment. • Record operating data such as products and quantities pumped, stocks used, gauging results and operation hours. • Inspect the concrete pump to ensure that tank levels, temperatures, chemical amounts and pressures are at specified levels. • Show how to check that the consistency of the concrete solution is suitable for smooth flow. • Demonstrate how to clear choking in the concrete pump by reversing the concrete flow. • Communicate with other employees and supervisors using signals, radios or telephones to start and halt the flow of concrete. • Show how to use controls, levers and switches in order to operate the concrete pump properly. • Demonstrate the process for

<p>capacities of pipelines, valve manifolds, pumps, and tanks.</p> <ul style="list-style-type: none">• Explain method of switching between rod side and piston side pumping and its purpose.• Elucidate the importance of maintaining the necessary concrete pressure and flow at different elevations.• Describe the different ways of testing the concrete mix, such as slump test and compression test.	<p>turning the concrete pump on and off.</p> <ul style="list-style-type: none">• Demonstrate how to use the emergency stop button to disable all power to the concrete pump in case of a crisis.• Show how to clean the concrete pump and valve.
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/N0121 v 2.0

Terminal Outcomes:

- Explain all the typical occupational hazards and techniques to overcome them.
- Elaborate the organization's performance criteria and processes.
- Outline the techniques for avoiding blockage in a concrete pump
- Plan for concrete pump maintenance on a scheduled basis.
- Demonstrate how to keep note of machine running hours to determine the best service plan.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Summarize the organization’s procedures and guidelines related to breakdown & maintenance services. • Elaborate the fundamental mechanical system at work in the different operations of the concrete pump. • Identify common problems in the concrete pump and general causes of breakdown and take relevant action. • Explain how to diagnose problems in the concrete pump. • Define the scope of the position and when and to whom to escalate for help. • Define safety protocols to be observed before undertaking any repair. • Describe the importance of regular cleaning of air filter dust bowls. • Identify the potential causes of any unusual noises coming from the concrete pump. • Identify prominent places on the concrete pump for display of safety and maintenance stickers. • Describe importance of daily greasing of all the greasing pins and pivot points. • Describe how to use 	<ul style="list-style-type: none"> • Create a checklist for inspection of the equipment to detect damage, flaws, cracks or leaks. • Demonstrate the procedure to clean the air filter dust bowls, pumps and valves. • Prepare a daily top-up plan of coolants, lubricants and fluids to ensure conformity with the manufacturer’s specifications. • Demonstrate the procedure to check that the greasing points are properly greased. • Check the battery electrolyte levels and condition of the terminals and carry out minor adjustments if required. • Check and maintain the tyre rims, air pressure, wheel nuts and treads as per manufacturer’s indications. • Verify that the machine is on firm and level ground before attempting to carry out any repair/ maintenance. • Demonstrate how to drain water and debris from the fuel tank. • Create daily /weekly maintenance sheets and carry out maintenance in conformance with the organization’s recommendation. • Create awareness to ensure that no maintenance task on any part of the concrete pump

<p>appropriate props /support devices while doing maintenance.</p>	<p>is performed when it is running or still hot.</p>
<p>Classroom Aids:</p>	
<p>Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer’s Service and Repair Manual</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Safety Gear, Tool Kit, PPE</p>	

Module 5: Health and safety

Mapped to NOS Code: IES/N 7601 v2.0

Terminal Outcomes:

- Describe the Health, safety, environmental (HSE) policies of the organization.
- Identify common hazards and risks at site.
- Explain safe working practices to use the tools to avoid common hazards and risks.
- Describe the emergency procedure to stop and shutdown the concrete pump.
- Demonstrate the procedure to give basic first aid.
- Demonstrate the operation of the fire extinguishers.
- Demonstrate safe storage and disposal of waste.
- List various safety signs, symbols and warnings used at site.

Duration: <10:00>

Duration: <20:00>

Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the Health, safety, environmental (HSE) policies of the organization. • Explain the reporting procedure for all HSE activities. • List down the contact details of HSE personnel, in case of emergencies. • Identify common hazards and risks at site. • Describe the emergency procedure to stop and shutdown the concrete pump. • Categorize waste based on non-recyclable, hazardous and recyclable material. • List various safety signs, symbols and warnings used at site. 	<ul style="list-style-type: none"> • Show the correct use of Personal Protective Equipment (PPE). • Demonstrate the operation of the fire extinguishers. • Demonstrate the procedure to give basic first aid. • Prepare a hazard log register to report incidents and accidents. • Conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate safe storage and disposal of waste. • Demonstrate safe working practices to use the tools to avoid common hazards and risks.
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: NG-Lx-ES-00001-2022-v1-DGT

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
<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • 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

	<p>neatly and maintaining hygiene for an interview</p> <ul style="list-style-type: none">• 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: Concrete Pump Operator Mapped to QP: IES/Q107 Version2.0. Minimum accepted score 70%.	Certified for Job Role: Concrete Pump 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: Concrete Pump Operator Mapped to QP: IES/Q107–Version2.0 Minimum accepted score 70%.	Certified for Job Role: Concrete Pump 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