



Model Curriculum

QP Name: Junior Excavator Operator

QP Code: IES/Q0104

QP Version: 3.0

NSQF Level: 4

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 | Junior Operator |
| Country | India |
| NSQF Level | 4 |
| Aligned to NCO/ISCO/ISIC Code | NCO-2015/ 8342.2001 |
| Minimum Educational Qualification and Experience | Ability to Read and Write with 5 years of relevant experience OR 5th Class pass with 4 years of relevant experience OR 8th Class pass with 1 year of relevant experience OR 8th Class pass with 1 year of NTC/ NAC OR 8th Class pass and pursuing continuous schooling in regular school with vocational subject |
| Pre-Requisite License or Training | NIL |
| 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 | 300 Hours |
| Maximum Duration of the Course | 300 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:

- Elaborate the organization's performance criteria and processes.
- Explain the organization's breakdown and maintenance procedures and guidelines
- Describe the Health, safety, environmental (HSE) policies.
- Demonstrate the proper use of the different accessories of the excavator.
- Illustrate the importance of daily greasing of all greasing pins and pivot points.
- Elaborate the procedure for storage and disposal of hazardous materials and waste.
- Classify various safety signs, symbols and warnings used 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 0107 NOS Name: Assist in performing pre-operation checks on the excavator NOS Version - 3.0 NSQF Level - 4 | 20 | 40 | 30 | 0 | 90 |
| NOS Code – IES/N 0108 NOS Name – Assist in operating the excavator NOS Version - 3.0 NSQF Level - 4 | 10 | 20 | 30 | 0 | 60 |
| NOS Code - IES/N 0109 NOS Name – Assist in routine maintenance and troubleshooting of the excavator NOS Version - 3.0 NSQF Level - 4 | 20 | 40 | 30 | 0 | 90 |
| NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 3.0 NSQF Level - 4 | 10 | 20 | 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 | 60 | 150 | 90 | 0 | 300 |

Module Details

Module 1: Orientation

Bridge Module

Terminal Outcomes:

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

| Duration:<4:00> Theory – Key Learning Outcomes | Duration:<0:00> 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 the Junior Excavator 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: Assist in Pre-operation checks on Excavator

Mapped to NOS Code – IES/N0110 v 3.0

Terminal Outcomes:

- Outline the performance standards, procedures and reporting structure followed in the organization.
- Classify the various excavators and their uses and functions.
- Assist in recording all activities performed before starting the excavator in the maintenance logbook.
- Assist with examining the track & sprockets for worn or cracked teeth.
- Check that the radiator coolant and oil levels in the engine, swing gearbox and track reduction unit are as specified by the manufacturer.
- Elucidate the EATS and EGR system.
- Assist in visual inspection of the different controls, gauges, warning lights and confirm that all safety and maintenance decals are present.
- Keep immediate work area clean and tools at their designated location.

| Duration: <10:00> | Duration: <50:00> |
|---|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Outline the performance standards, procedures and reporting structure followed in the organization. • Classify the various models of excavators and their uses and functions. • Know the parameters to be included in a checklist for pre operation inspection of the excavator to detect damage, flaws, cracks or leaks. • Explain the importance of maintaining a logbook to record all actions completed prior to starting the excavator. • Elucidate the EATS and EGR system. • Explain the engine and | <ul style="list-style-type: none"> • Assist in recording all activities performed before starting the excavator in the maintenance logbook. • Assist in visual inspection of the different controls, gauges, warning lights and confirm that all safety and maintenance decals are present. • Check that the radiator coolant and oil levels in the engine, swing gearbox and track reduction unit are as specified by the manufacturer. • Assist with examining the track & sprockets for worn or cracked teeth. • Keep immediate work area clean and tools at their designated location. • Assist in inspecting the different controls, gauges, warning lights to confirm that all are working. • Help to clean the air filter dust bowls and check that the gasket and inner |

| | |
|--|---|
| <p>hydraulic pump, as well as their use and purpose.</p> <ul style="list-style-type: none"> • Elucidate the excavator components, such as the boom, stick and other attachments and their functions. • Identify the location of all the drain points of the lubricants and know the service intervals. • Explain the importance of Ad Blue (DEF) and assist in monitoring its level. • Describe how to fit the piping kit of the breaker attachment. | <p>filter are in good condition.</p> <ul style="list-style-type: none"> • Assist the operator in checking that all cabin controls including electronic display are functioning properly • Assist in performing a visual inspection by walking around the excavator prior to starting and help to rectify any leakages that are observed. • Check that the suspension seat adjustment control is properly selected to match the operator's weight. • Check that the travel pedal and travel lever are functioning properly. • Help to top up the Ad Blue (DEF) as required. |
| <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 3: Assist in Excavator operations

Mapped to NOS Code – IES/N0111 v 3.0

Terminal Outcomes:

- Help the operator to start the engine in extreme cold with the use of the ignition switch and heater mechanism.
- Assist in ensuring that walkway rules (operating the excavator within the permissible/ allocated areas) are followed.
- Guide the operator in maintaining a safe distance from other plants and vehicles.
- Elaborate the proper use of different attachments of Excavator.

| Duration:<30:00> Theory – Key Learning Outcomes | Duration:<90:00> Practical – Key Learning Outcomes |
|---|--|
| <ul style="list-style-type: none"> • Summarize the organization’s procedures and guidelines related to excavator operations. • Outline the organization's performance criteria and processes. • Elaborate the steering techniques and the proper way to steer on a slope. • List best practices during operation for optimum productivity. • Explain the reason for keeping the excavator in low idle RPM for 2 to 5 minutes after starting and before shutting down. • Explain the ISO indicators with relation to the product. • Explain the Joystick functions (ISO or cross pattern). • Elaborate the proper use of different attachments of Excavator. • Explain the function and location of the ECU and various electronics inside the operator cabin. • Understand the significance of various error codes in the | <ul style="list-style-type: none"> • Help the operator to start the engine in extreme cold with the use of the ignition switch and heater mechanism. • Assist in creating and maintaining logbooks as prescribed by the organization. • Assist in ensuring that walkway rules (operating the excavator within the permissible/ allocated areas) are followed. • Guide the operator in maintaining a safe distance from other plants and vehicles. • Assist in choosing the proper attachment for the excavator according to the job requirement. • Assist the operator in judging the gradient of the excavator travel limitation and to operate accordingly. • Assist in maintaining the bench height based on the tipper’s size while keeping the loading angle at 45° to get the best productivity. • Assist in adjusting the safety belt and using the safety lever while operating the Excavator. |

| | |
|---|--|
| <p>I-ECU.</p> <ul style="list-style-type: none">• Explain the purpose of each decal inside the cabin. | <ul style="list-style-type: none">• Assist in operating and navigating the keypad of the computer.• Assist in reading the gauges on the control panel for Hydraulic Oil Temperature, Engine Oil pressure, Battery charge and Electrolyte level. |
| 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: Assist in routine maintenance and trouble shooting

Mapped to NOS Code: IES/N0112 v 3.0

Terminal Outcomes:

- Explain the organization's breakdown, maintenance procedures and guidelines.
- Describe the reporting structure in the company.
- Assist in the process to monitor machine working hours for determining the best service plan.
- Illustrate the importance of grease all greasing pins and pivot points every day.
- Assist in timely and legibly completing the daily/ weekly maintenance sheets

| Duration: <10:00> | Duration: <50:00> |
|--|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> • Explain the organization's breakdown, maintenance procedures and guidelines. • Describe the reporting structure in the organization. • Demonstrate how to determine the best service plan on the basis of excavator running hours. • Map out the schedule for resolving the complaint/problem. • Illustrate the importance of grease all greasing pins and pivot points every day. • Know the safety protocols to be followed in excavator repair and maintenance. • Identify common problems in the excavator and general causes of breakdown and take relevant action. • Explain how to diagnose problems in the excavator. | <ul style="list-style-type: none"> • Assist in creating a checklist and inspect the excavator to detect damage, flaws, cracks or leaks. • Assist in timely and legibly completing the daily/ weekly maintenance sheets • Help to employ appropriate props/support device for maintenance. • Help to clean the air filter dust bowls, pumps and valves. • Assist in daily top-up plan of coolants, lubricants and fluids to ensure conformity with the manufacturer's specifications. • Check the battery electrolyte levels and condition of the terminals and carry out minor adjustments if required. • Help to verify that the excavator is on firm and level ground before attempting to carry out any repair/ maintenance. • Help to drain water and debris from the fuel tank as needed. |
| 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 7602 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.
- Explain emergency procedure to stop and shutdown the excavator.
- Assist in carrying out basic first-aid treatment for common injuries.
- Assist in 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 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 excavator. • Categorize waste on the basis of 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). • Assist in the operation of firefighting equipment. • Assist in carrying out basic first-aid treatment for common injuries. • Assist in the preparation of a hazard log register to report incidents and accidents. • Help to conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate the 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: 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 |

| | |
|--|---|
| <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 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: Junior Excavator Operator Mapped to QP: IES/Q104 Version2.0. Minimum accepted score 70%. | Certified for Job Role: Junior Excavator 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: Excavator Operator Mapped to QP: IES/Q104–Version2.0 Minimum accepted score 70%. | Certified for Job Role: Excavator 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 |