



Model Curriculum

QP Name: Batching Plant Operator

QP Code: IES/Q 0116

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	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8114.0200
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	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	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:

- Discuss the performance standards & procedures followed in the organization.
- Classify the different types of batching operation such as manual, semi-automatic and automatic.
- Know how to track plant operation hours in accordance with organizational standards to determine the best service schedule.
- Describe the emergency procedure to stop and shutdown the batching plant.
- Demonstrate the steps to input data in the computer system according to the mix design.

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 0146 NOS Name: Carry out pre-operation checks on a batching plant NOS Version - 3.0 NSQF Level - 4	30	30	60	0	120
NOS Code – IES/N 0147 NOS Name – Carry out batching plant operations NOS Version - 3.0 NSQF Level - 4	30	60	30	0	120
NOS Code - IES/N 0148 NOS Name - Carry out maintenance and troubleshooting of the batching plant 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
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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 about the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Batching Plant Operator.

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 the Batching Plant 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-operation checks in Batching Plant

Mapped to NOS Code – IES/N0146 v 3.0

Terminal Outcomes:

- Discuss the performance standards & procedures followed in the organization.
- List the different types of batching plants, their uses and functions.
- Show how to ensure that the cement bin aeration system is in good working order.

- Show how to ensure that all bins and silos are full as per the production requirement.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the organization's breakdown and maintenance processes and guidelines. • Discuss the performance standards & procedures followed in the organization. • Know the reporting structure in the organization. • Elaborate the schedule for resolving the complaint /problem. • Describe the uses of the tools in the tool kit and its storage place. • List the different types of batching plants, their uses and functions. • Classify the different equipment in batching plant such as conveyors, dust collector aggregate storage bins. • Elaborate the importance of lubricating various components, bearings and gears of the concrete batching plant. • Describe the process to store the liquid admixtures properly to avoid contamination. • Introduce the weighing systems, aggregate storage systems, water systems, conveying systems and admix systems, as well as their application and operation in the batching plant. • Expound the position and operation of instrument panel / cabin controls, including electronic displays, sensors. • Explain why all bolts and bearing set screws should be inspected and tightened • Explain the procedure to keep the generator running and keep the 	<ul style="list-style-type: none"> • Show how to inspect the oil and filter on the air compressor, drain the tank manifolds and all water traps according to the manufacturer's instructions. • Demonstrate the procedure set by the manufacturer to check the oil level in all the gear boxes, hydraulic unit, drum motor and auto-roll. • Show how to ensure that the cement bin aeration system is in good working order. • Show how to ensure that all bins and silos are full as per the production requirement. • Illustrate the procedure to check the tension on all v-drive and other belts for wear and strain. • Verify that the admixture dispensers are in proper working condition. • Ensure that the safety equipment is present and securely mounted. • Inspect the electric drive motors for wire damage and loose electrical fittings. • Ensure that the motor is turned off before cleaning or chipping a mixer. • Examine the area under the plant for spillage and its source. • Visually inspect the load cells, housing and gates. • Show how to examine all the hoppers and doors to ensure that they are clean and in good working order. • Show how to examine the conveyors, boom scrapers and skip bucket for free running and wear making adjustments as

<p>voltage and frequency at acceptable levels</p> <ul style="list-style-type: none"> • Explain importance of an inspection /maintenance logbook to record all activities performed before starting the batching plant and deviations that do not conform to the specified standards. • Identify faults outside the scope of the position which should be notified to the operator. • Explain why it is necessary to check and remove any cement or concrete build up in the mixer. • Expound the practice to ensure weigh hoppers are emptied from the previous day's operation. 	<p>needed.</p> <ul style="list-style-type: none"> • Show how to examine the central mixer blades, strippers, and arms for wear and tightness. • Demonstrate examination of the hydraulic connections for tightness as well as the condition of the flexible tubing. • Demonstrate examination of the dust seals on cement hoppers for wear. • Inspect the mixing drum for structural cracks and damage. • Show how to check and confirm that all cabin controls including electronic displays and sensors are in good working order. • Ensure that the batching plant has an empty running drum before the work starts.
<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 and PPE</p>	

Module 3: Batching Plant operations

Mapped to NOS Code – IES/N0147v 3.0

Terminal Outcomes:

- Explain the reporting structure in the Organization.
- Describe the different types of control systems in a batching plant: manual / semi-automatic /automatic operations.
- Know about the different types of aggregate storage systems.
- Elaborate the basic batching plant operation procedure.
- Demonstrate the steps to enter and modify data in the computer system according to the mix design.
- Demonstrate the process to ensure that the manufacturing process and product adhere to the required schedule and quality standards.

Duration:<30:00>	Duration:<90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Understand how to plan and arrange the work in accordance with organisational norms. • Explain the reporting structure in the Organization. • Know the cost of the batching plant and the loss to the Organization resulting from its damage and the direct/ indirect cost of accidents. • Elaborate the basic batching plant operation procedure. • Classify the different types of mixers such as - pan mixer - turbo pan mixer - single shaft/twin shaft compulsory mixer. • Describe the different types of control systems in a batching plant: manual / semi-automatic /automatic operations. • List the various grades of cement and materials required. • Know about the different types of aggregate storage systems. • Explain the different methods of feeding cement using manual hopper feeding, screw conveyor and blower compressor. • Elucidate the different admixtures that are added to 	<ul style="list-style-type: none"> • Demonstrate the process to switch on the power to the control panel in accordance with the operational manual. • Illustrate how to monitor and regulate materials like the aggregates, cement, water and admixtures. • Employ the practise to coordinate with ground personnel, loader operators and truck drivers. • Ensure that shut-down processes are followed in a sequential manner. • Demonstrate the procedure to clean the drum mixer properly. • Demonstrate how to use the emergency stop button to disable all power to the batching plant in case of a crisis. • Show how controls are used to release batched concrete into delivery trucks/mixers. • Ensure that the truck is appropriately positioned under the chute and that the drum is pointed in the right direction. • Demonstrate the process to ensure that the manufacturing process and

<p>concrete mixes, such as aerators, retarders, super plasticizers, accelerators, colours, water reducers and fibre mesh.</p> <ul style="list-style-type: none"> • Know the steps to enter and modify data in the computer system according to the mix design. 	<p>product adhere to the required schedule and quality standards.</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 and PPE</p>	

Module 4: Routine maintenance and basic trouble shooting of Batching Plant

Mapped to NOS Code: IES/N0148 v 3.0

Terminal Outcomes:

- Outline the organization's breakdown and repair processes and guidelines.
- Describe the various lubricants used in the batching plant and their applications.
- Classify the different types of load cell.
- Know how to track plant operation hours in accordance with organizational standards to determine the best service schedule.
- Identify the tools in the tool kit and explain their use.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Outline the organization's breakdown and repair processes and guidelines. • Outline the procedure to notify the supervisor if a fault is found that is outside the scope of the operator's job role. • Know how to track plant operation hours in accordance with organizational standards to determine the best service schedule. • Define safety protocols to be observed before undertaking any repair. • Describe the various lubricants used in the batching plant and their applications. • Identify common defects and general causes of breakdown. • Describe the fundamentals of the pneumatics and hydraulic systems of the batching plant. • Know the location and operation of the instrument panel and communication devices. • Elucidate the basic electrical operation and repair process. • Describe the various types of earthing and their application. • Classify the different types of load cell. 	<ul style="list-style-type: none"> • Create a checklist for inspection of the batching plant to detect damage, flaws, cracks or leaks. • Create daily /weekly maintenance sheets and carry out maintenance in conformance with the organization's recommendation. • Demonstrate the procedure to check that the air filters on the air compressor and aeration blowers are cleaned. • Illustrate the steps to adjust tension of the chain and scoops unit. • Employ the practise to ensure that defective parts are replaced. • Demonstrate how to use appropriate props /support devices while doing maintenance. • Show how to clean the magnetic oil plugs during each oil change. • Prepare a daily top-up plan of coolants, lubricants and fluids to ensure conformity with the manufacturer's specifications. • Show how to lubricate all bearings including head and tail pulleys on all conveyors, head and tail bearing on cement feeder screws wheel bearing

<ul style="list-style-type: none"> • Identify the tools in the tool kit and explain their use. • Identify prominent places on the batching plant for display of safety and maintenance stickers. • Elaborate the functions of the discharge door and its settings. 	<p>supports on turn head and aggregate gate pivot points.</p> <ul style="list-style-type: none"> • Inspect and adjust all belt wipers.
<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 and PPE</p>	

Module 5: Health and safety

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

Terminal Outcomes:

- Describe the Health, safety, environmental (HSE) policies of the organization.
- Identify common hazards and risks at site.
- Describe the emergency procedure to stop and shutdown the batching plant.
- 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 batching plant. • Categorize waste based on non-recyclable, hazardous and recyclable material. • List various safety signs, symbols and warnings used at site. • Explain safe working practices to use the tools to avoid common hazards and risks. 	<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 record 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. • Demonstrate how to use the safety equipment used in batching plant.
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: Batching Plant Operator Mapped to QP: IES/Q 0116 Version2.0 Minimum accepted score 70%.	Certified for Job Role: Batching Plant 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
<p>Certified for Job Role: Batching Plant Operator Mapped to QP: IES/Q 0116 –Version2.0 Minimum accepted score 70%.</p>	<p>Certified for Job Role: Batching Plant Operator Minimum accepted score 70%.</p>

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