

Model Curriculum

Batching Plant Operator

SECTOR: INFRASTRUCTURE EQUIPMENT
SUB-SECTOR: EQUIPMENT OPERATIONS
OCCUPATION: OPERATOR
REF ID: IES/Q0116, V1.0
NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

INFRASTRUCTURE EQUIPMENT SKILL COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Batching Plant Operator' QP No. 'IES/Q 0116 NSQF Level 4'

Date of Issuance: June 1st, 2017

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Authorized Signatory
(Infrastructure Equipment Skill Council)

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Batching Plant Operator

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Batching Plant Operator”, in the “Infrastructure Equipment” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Batching Plant Operator		
Qualification Pack Name & Reference ID	IES/Q0116		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	Preferably Class 8th Standard Certification Training in Batching Plant Operations preferred Preferably 2 year’s experience as Junior Batching Plant Operator.		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Carry out pre-operation checks on a batching plant. General introduction to batching plants, basic working of various components sections, engine, hydraulic and electrical systems, operational controls and instrument panel, preparing machine and related systems for operations • Carry out batching plant operations. Properties of materials cement and aggregates, starting of batching plant, loading of materials, monitoring and regulating mixing, discharging of concrete, shutting down the plant; post-operative checks • Carry out maintenance and trouble shooting of a batching plant. General maintenance procedures and periodic service schedule; common faults and their diagnosis; reports and documents. • Comply with worksite health and safety guidelines. Health, safety and environment policies; personal protective equipment, fire-fighting equipment, basic first aid for common injuries at work site 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Batching Plant Operator” Qualification Pack issued by “Infrastructure Equipment Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Carry out pre-operation checks on a batching plant</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code IES/N0125</p>	<p>Organisational Context: Acquire working knowledge of the following:</p> <ul style="list-style-type: none"> • Organisation structure, reporting and escalation line. • Performance standards and procedures in the company. • Work target and review mechanism with supervisor • Location and process for storage and disposal of waste. • Safety policy of the organisation and emergency procedures <p>Technical Knowledge: Understand the fundamentals of the following:</p> <ul style="list-style-type: none"> • Different types of batching plants, features and performance. • Components and sections of batching plant and its functioning. • Equipment operating systems: <ul style="list-style-type: none"> ○ Hydraulic, electrical, pneumatic. ○ Weighing, storage, conveying, admix • Controls, levers, switches and instrument panel & fuse box • Procedure for filling and topping up of fuel, coolant, oils • Method of greasing and lubrication. • Optimal working condition of components and monitoring systems • Documents and log books to be maintained for recording activities. • Procedures for reporting defects if beyond his scope. <p>Skills - Core & Professional. Acquire the ability to:</p> <ul style="list-style-type: none"> • Read & understand general instructions/guidelines related to equipment & worksite ops. • Write and record any incidents & deviations on the prescribed formats. • Orally communicate information & instructions to co-workers in a clear and concise manner. • Plan and organise work related tasks with all concerned in most efficient and cost effective way. 	<ul style="list-style-type: none"> • <u>Scaled Model of Batching Plant for theory sessions</u> • <u>Live Batching Plant at nearby project site for practical sessions</u> • Class room with audio-video system • Manufacturers O and M Manual & Video • Safety video • PPE Items & Safety Gear

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>Performance Criteria: Execute the following tasks and procedures:</p> <ul style="list-style-type: none"> Examine all parts, components and sections of the plant for damage and leakages. Check all fluid levels in the engine, hydraulic & water systems; top up where necessary Check all V-drive and other belts for tension, wear and tear. Check conveyors, boom scrapers and bucket elevators for free running. Fill all bins and silos as per instructions. Store the admix as per instructions and check dispensers are functional. Empty the weigh hoppers of previous days operations. Check all hoppers and doors for cleanliness and smooth functioning. Remove cement and concrete build-up in the mixer and clean. Inspect all greasing points and ensure lubrication. Check all electrical wiring for damage and fitting. Check all controls, gauges, lights and horns are functional. Ensure safety equipment in place before operating the plant. Maintain a log book to record all actions done before starting. Follow laid down procedure for reporting defects beyond his scope. 	
2	<p>Carry out batching plant operations.</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 75:00</p> <p>Corresponding NOS Code IES/N0126</p>	<p>Organisational Context: Acquire working knowledge of the following:</p> <ul style="list-style-type: none"> Procedures and guidelines related to breakdown & maintenance services. Location of tools and equipment and procedure for issue and return. Safety policy of the organisation and emergency drills. <p>Technical Knowledge. Understand the fundamentals of the following:</p> <ul style="list-style-type: none"> Specs and features/performance/output of the batching plant. Type and grade of cement, aggregates and admixture. Feeding system into silos. Starting procedure, basic operations and monitoring systems. Stopping procedure including emergency stop button 	<ul style="list-style-type: none"> Scaled Model of Batching Plant for theory sessions Live Batching Plant at nearby project site for practical sessions Adequate stocks of cement, admixture and other aggregates. Class room with audio-video system Manufacturers O and M Manual & Video Safety video PPE Items & Safety Gear

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> • Identification and correct usage of basic tools. • Various hand signals, safety & emergency signs at project site. • Basic computer and MS Office applications & printer settings. <p>Skills - Core & Professional. Acquire the ability to:</p> <ul style="list-style-type: none"> • In addition to core and generic skills listed above • Interpret signage at project work site correctly. • Use correct terminology while interacting with others at site • Help plan work schedule in time bound and cost effective way. • Help identify operational slow-downs and take timely remedial action. <p>Performance Criteria. Execute the following tasks and procedures:</p> <p>Starting and Monitoring.</p> <ul style="list-style-type: none"> • Starting of components /systems in the correct order. • Monitoring and regulating materials as per instructions. • In crisis operate emergency button to disconnect power to the plant. <p>Discharging of Concrete.</p> <ul style="list-style-type: none"> • Ensure truck is correctly positioned under sock • Discharging the batched concrete safely and correctly into the delivery trucks /mixers. <p>Shutting down and servicing</p> <ul style="list-style-type: none"> • Shut down the batching plant as per sequential procedures • Clean the drum mixer and rubber chute internally. • Wash the batching plant externally with water to remove all deposits. • Ensure equipment is lubricated correctly. • Inspect for damages; leaks etc and report / take appropriate action. <p>Safety during operations</p> <ul style="list-style-type: none"> • Ensure PPE is worn especially dust mask when moving around the plant. • Ensure proper communication through correct hand signals and eye contact 	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>Reporting and Documentation</p> <ul style="list-style-type: none"> Maintain log book to record all activities (input and output flow) carried out. Report any defects which are beyond his scope to the supervisor 	
3	<p>Carry out routine maintenance and trouble shooting of a batching plant.</p> <p>Theory Duration (hh:mm) 14:00</p> <p>Practical Duration (hh:mm) 35:00</p> <p>Corresponding NOS Code IES/N0127</p>	<p>Organisational Context: Acquire working knowledge of the following:</p> <ul style="list-style-type: none"> Emergency organisation structure and maintenance policy. Location of special tools and equipment/ accessories. <p>Technical Knowledge. Understand the fundamentals of the following:</p> <ul style="list-style-type: none"> Maintenance and service Schedule including related checklists Common defects and general causes for breakdown. <p>Skills - Core & Professional. Acquire the ability to:</p> <ul style="list-style-type: none"> In addition to core and generic skills listed above; Plan maintenance & servicing keeping operational needs in mind. <p>Performance Criteria. Execute the following tasks and procedures:</p> <p>Routine Maintenance:</p> <ul style="list-style-type: none"> Assess the right service schedule by tracking operating hours. Wash & clean the plant externally to remove deposits Clean drum mixer internally as per instructions. Clean air filter, replenish lubes and coolants as necessary Lubricate/grease all the moving joints/pins and pivot points. Ensure basic housekeeping activities in the control room. <p>Basic Trouble Shooting:</p> <ul style="list-style-type: none"> Turn off the mains power from panel before carrying out maintenance activity. Diagnosing the defect/ problem and rectify; if need be seek advice from supervisor. 	<ul style="list-style-type: none"> Scaled Model of Batching Plant for theory sessions Live Batching Plant at nearby project site for practical sessions Class room with audio-video system Manufacturers O and M Manual & Video Safety video PPE Items & Safety Gear

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		Documentation & Reporting: <ul style="list-style-type: none"> Maintain all records/documents as per company policy. Report defects and problems in time and escalate as necessary 	
4	Comply with Worksite Health and Safety Guidelines Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 20:00 Corresponding NOS Code IES/N7601	Organisational Context. Acquire working knowledge of the following: <ul style="list-style-type: none"> Health, safety, environmental (HSE) policies and guidelines of the company & their importance Contact details of personnel responsible for HSE related matters & in case of emergencies. Location of first aid room / station and assembly points. Reporting channel and documentation procedure for all HSE related matters. Technical Knowledge. Understand the fundamentals of the following: <ul style="list-style-type: none"> OEMs guidelines for health, safety and security requirements. Types, use and importance of Personal Protective Equipment (PPE) Types of common hazards and risks at worksite and preventive measures. In case of emergencies procedure to stop/ shut down machinery. Common injuries and appropriate basic first aid treatment. Firefighting equipment: Basic knowledge of handling and using them. Guidelines for transport, storage and disposal of hazardous materials and waste Safety signs/symbols and warnings used in worksites and their meaning Skills - Core & Professional. Acquire the ability to: <ul style="list-style-type: none"> In addition to the core and generic skills listed above Use correct PPE and other safety gear while in the work site. Performance Criteria. Execute the following tasks and performances: <ul style="list-style-type: none"> Comply with safety, health, environment and security related regulations & guidelines at work. 	<ul style="list-style-type: none"> Scaled Model of Batching Plant for theory sessions Live Batching Plant at nearby project site for practical sessions Class room with audio-video system Organisation's ESH / Safety video PPE Items & Safety Gear Firefighting equipment & Charts First Aid Kit and Charts

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> • Correct use of Personal Protective Equipment (PPE) and other safety gear at work site. • Follow safety measures during operations to ensure health and safety of self and others; general public not at risk. • Operate fire extinguishers as applicable. • Support in administering basic first aid. • Record and report details as related to operations, incidents or accidents as applicable. 	
	Total Duration Theory Duration 60:00 Practical Duration 150:00	Unique Equipment Required: <ul style="list-style-type: none"> • <u>Scaled Model of Batching Plant for theory sessions</u> • <u>Live Batching Plant at nearby project site for practical sessions</u> • Adequate stocks of cement, admixtures and other aggregates. • Class room with audio-video projection system • Manufacturers O and M Manual & Video; Safety video • PPE Equipment: Helmet, gloves, earplugs, goggles, safety shoes • Firefighting equipment and 'How to Use' Charts • First Aid Box and 'How to Do' Charts 	

Grand Total Course Duration: 210 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by [Infrastructure Equipment Skill Council](#))

Trainer Pre-requisites for Job role: “Batching Plant Operator” mapped to Qualification Pack: “IES/Q0116, v1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ <u>IES/Q 0116 Version 1.0</u> ”.
2	Personal Attributes	Aptitude for conducting training, with strong communication and interpersonal skills. Passion for training and developing others; well-organised; and a team player. Eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Class 8 th ; preferably 10 th
4a	Domain Certification	Certified for Job Role: “ <u>Batching Plant Operator</u> ” mapped to QP: “ <u>IES/Q 0116 – Version 1.0</u> ”. Minimum accepted score 70%. Desired: Certification Training in Batching Plant Operations & Maintenance
4b	Platform Certification	Certified for Job Role: “ <u>Batching Plant Operator</u> ” mapped to Qualification Pack: SSC/1402. Minimum accepted score 70%.
5	Experience	<ul style="list-style-type: none"> • Around 3 to 4 years’ site experience in Batching Plant Operations. • At least 1 to 2 years’ experience in conducting O and M training programs.

Assessment Criteria	
Job Role	Batching Plant Operator
Qualification Pack	IES/Q 0116 Version 1.0
Sector Skill Council	Infrastructure Equipment

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for Qualification Pack has 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.
2	The assessment of the theory/knowledge will be based on written test/viva or both while skill test shall be hands on practical. Behaviour and attitude will be assessed while performing the assigned task.
3	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 centres (as per assessment criteria below)
4	To pass the Qualification Pack, every trainee should score a minimum of 40% in each NOS and 60% aggregate. 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.

Assessment Outcomes	Assessment Criteria for the outcome	Total Mark	Marks Allocation		
			Out Of	Theory	Skills Practical
1. IES/N0125 Carry out pre-operation checks on a batching plant	PC1. Inspect oil and filter on air compressor, drain tank manifolds and all water traps as per the procedures set by the manufacturer	30	2	1	1
	PC2. Check the oil level in all gear boxes, hydraulic unit, drum motor oil and auto-roll as per the procedures set by the manufacturer		2	1	1
	PC3. Ensure that the cement bin aeration system is operating properly		1.5	0.5	1
	PC4. Ensure that all bins and silos are full as per the production requirement		1.5	0.5	1
	PC5. Inspect tension on all V-drive belts and other belts for wear and tear		1.5	0.5	1

	PC6. Ensure that liquid admixtures are stored as per the organizational standards to avoid contamination		1	0.5	0.5
	PC7. Check that admixture dispensers are in good working condition		0.5	0	0.5
	PC8. Ensure that safety equipment is present and securely mounted as per the organizational standards		2	1	1
	PC9. Check for wiring damage and loose electrical fitting for the electric drive motors		1	0.5	0.5
	PC10. Ensure mixer motor is turned off before carrying out mixer cleaning or chipping		1	0.5	0.5
	PC11. Ensure weigh hoppers are emptied from the previous day's operation		0.5	0	0.5
	PC12. Check the area under plant for spillage and trace source		0.5	0	0.5
	PC13. Ensure visual inspections are carried out for broken load cells, leaks, dust build-up in bag house, worn gates,		1.5	0.5	1
	PC14. Check conveyors, boom scrapers and bucket elevators for free running and wear, and adjust as necessary		1	0	1
	PC15. Check all hoppers and doors are in clean and efficient working order		1	0	1
	PC16. Check central mixer blades, strippers or arms for wear and tightness and adjust as necessary		1	0	1
	PC17. Check tightness of all hydraulic connections and the condition of flexible tubes		0.5	0	0.5
	PC18. Check and remove any cement or concrete build up in the mixer		1	0.5	0.5

	PC19. Check dust seals on cement hoppers for wear		0.5	0	0.5
	PC20. Ensure that bearings and gears are properly greased		1	0.5	0.5
	PC21. Check mixer drum for structural cracks or damage		0.5	0	0.5
	PC22. Inspect and tighten all bolts and bearing set screws		1	0	1
	PC23. Maintain power generator, monitor voltage and frequency at appropriate levels		1	0	1
	PC24. Check and ensure that all cabin controls including electronic display, sensors, etc. are functioning properly		1	0	1
	PC25. Ensure that before work, the machine should have an empty running		1	0.5	0.5
	PC26. Maintain a checking/maintenance logbook to record all activities performed before starting the batching plant		1.5	1	0.5
	PC27. Report defects precisely to the supervisor if beyond scope of his role		1.5	1	0.5
		Total	30	10	20
2. IES/N0126 Carry out batching plant operations	PC1. Plan and organize the job as per the organizational procedures	35	1	0.5	0.5
	PC2. Start genset and activate cross-over switch		0.5	0	0.5
	PC3. Check panel to ensure that controls are in correct position for starting		1.5	0.5	1
	PC4. Turn on control panel power as per the operational manual		0.5	0	0.5
	PC5. Enter and adjust values in computer system as per the mix design		1	0	1

	PC6. Start components in correct order through computer controls		1	0	1
	PC7. Ensure the production process and product complies with the appropriate quality procedures		1.5	0.5	1
	PC8. Monitor and regulate materials such as proportions of aggregates, cement, water, and admixtures		2.5	0.5	2
	PC9. Use the emergency stop button to disable all power to the batching plant in case of a crisis, as per operator manual		1.5	1	0.5
	PC10. Coordinate with ground personnel, loader operators and truck drivers		1	0.5	0.5
	PC11. Ensure that truck is properly positioned under sock to ensure correct direction of the drum		1.5	0.5	1
	PC12. Discharge batched concrete into delivery trucks/mixers using appropriate controls		1	0	1
	PC13. Ensure batches are produced on time and as per the specifications		2	1	1
	PC14. Ensure that sequential procedures for shut down		2	1	1
	PC15. Ensure that feed is stopped using appropriate controls as per the operational manual		1	0	1
	PC16. Clean drum mixer internally as per the operational manual		1.5	0.5	1
	PC17. Wash the batching plant externally with water to remove all built-up deposits		1.5	0.5	1
	PC18. Conduct visual inspection of the equipment		1.5	0.5	1

	PC19. Ensure that the equipment is lubricated properly		1.5	0.5	1
	PC20. Ensure defective components are replaced immediately		1	0	1
	PC21. Clean the rubber chute that discharges the cement into the mixer		1	0	1
	PC22. Wear dust masks when working around the plant		2	1	1
	PC23. Make positive eye contact with other equipment operators at the site before crossing in front of or behind the equipment		1.5	1	0.5
	PC24. Wear all PPE while sampling concrete and for all operations		2	1	1
	PC25. Record input and output flow as per the desired formats of the organization		2	1	1
		Total	35	12	23
3. IES/N0127 Carry out maintenance and troubleshooting of the batching plant	PC1. Assess the right service schedule by tracking plant operating hours as per organizational procedures	20	1.5	1	0.5
	PC2. Perform basic housekeeping activities in the control room		2	1	1
	PC3. Lubricate all bearings including head and tail pulleys on all conveyors, head and tail bearing on cement feeder screws wheel bearing supports on turn head, aggregate gate pivot points etc		3	1	2
	PC4. Inspect and /or adjust all belt wipers		1	0	1
	PC5. Blow clean all air filters on air compressor and aeration blowers		0.5	0	0.5

