

Model Curriculum

Junior Tower Crane Operator/ Signalman

SECTOR: INFRASTRUCTURE EQUIPMENT
SUB-SECTOR: EQUIPMENT OPERATIONS
OCCUPATION: MACHINE OPERATION
REF ID: IES/Q0123, V1.0
NSQF LEVEL: 3



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

INFRASTRUCTURE EQUIPMENT SKILL COUNCIL

for the

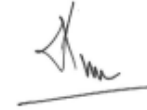
MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: ' Junior Tower Crane Operator/Signalman' QP No. 'IES/ Q 0123 NSQF Level 3'

Date of issuance: April 1st, 2018

Valid up to: March 31st, 2020

* Valid up to the next review date of the Qualification Pack



Authorized Signatory
(Infrastructure Equipment Skill Council)

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Junior Tower Crane Operator / Signalman

CURRICULUM / SYLLABUS

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

Program Name	Junior Tower Crane Operator/Signalman		
Qualification Pack Name & Reference ID	IES/Q0123		
Version No.	1.0	Version Update Date	28 June 2018
Pre-requisites to Training	Class 8th 1 to 1.5 years' experience as assistant in equipment operations		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Assist in pre-operation checks for tower crane by inspecting, preparing and testing the functions of all controls and systems of the machine including its monitoring, communicating and safety devices. • Assist in tower crane operations by inspecting the worksite, understanding the task, planning the methodology and executing it precisely and safely within the allotted resources and time frame. • Assist in regular maintenance of tower crane by selecting and carrying out the relevant service schedule, diagnosing and rectifying common faults, compiling and submitting reports as per organisations policy. • Comply with worksite health and safety guidelines by following processes and procedures related to personal protective equipment, basic first aid for common injuries at work site, emergency evacuation and disposal of hazardous waste. 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Junior Tower Crane Operator / Signalman” Qualification Pack issued by “Infrastructure Equipment Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Assist in pre-lifting operations Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 16:00 Corresponding NOS Code IES/N0167	<ul style="list-style-type: none"> Identify different parts, components and systems of tower crane and its broad functioning. Identify various rigging tools, hand tools, lifting tools and tackles; and learn its correct usage for lifting tasks Check availability of lifting gears, tools and tackles. Select and use appropriate rigging gears required for heavy material shifting. Inspect wire rope slings, webbing slings and chain slings for obstructions that may hinder lifting operations. Ensure structural components of equipment are placed away from overhead power and service lines Ascertain weight of load, centre of gravity and appropriate rigging of load to sling as per requirement Estimate clearance of swing path on the site and check for blind spots. Prepare base for lifting equipment and load to be lifted as per the requirement. Inspect work location for barricading, signages and availability of PPEs. Set up communications for safe lifting operations / guidance and test it with the crane operator Acquire the technique of guiding suspended objects through tag lines. Acquire the ability to read and comprehend basic signs, symbols, diagrams, charts and decals on the equipment. Communicate information & instructions using correct tech terms and phrase to team members /supervisor in a clear and concise manner. 	<ul style="list-style-type: none"> Tower Crane with standard tools, accessories and equipment. Class room with audio-video system Manufacturers O and M Manual & Video Safety video PPE Items & Safety Gear Open ground
2	Assist in tower crane operations. Theory Duration (hh:mm) 18:00 Practical Duration (hh:mm)	<ul style="list-style-type: none"> Understand load characteristics, centre of gravity and lifting points to determine method of slinging. Determine and check the route of the load before and during the lift to include distances, clearances and landing position. Communicate with the crane operator 	<ul style="list-style-type: none"> Tower Crane with standard tools, accessories and equipment. Range of weighted loads with lifting hooks. Class room with audio-video system

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	36:00 Corresponding NOS Code IES/N0168	<p>using communication device or hand signal for lifting and manoeuvring the load.</p> <ul style="list-style-type: none"> Monitor balance and stability of loads through constant observation and coordination with operator. Prepare base for unloading of materials along with other team members and supervisor. Assist team in cordoning off the lifting and lowering areas using barricades etc as applicable. 	<ul style="list-style-type: none"> Manufacturers O and M Manual & Video Safety video PPE Items & Safety Gear Open ground
3	<p>Assist in regular maintenance of a tower crane.</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code IES/N0169</p>	<ul style="list-style-type: none"> Assist in positioning the machine correctly and safely before carrying out any maintenance activity Inspect crane structure for deformed, cracked or corroded members and rectify as necessary Assist in checking the functioning of all control mechanisms and monitoring devices. Assist in servicing the hoisting and stabilizing system; as laid down in the maintenance manual Assist in inspecting the engine, hydraulic & electrical systems and servicing the various components as per the guidelines. Assist in diagnosing the defect/problem and rectify using appropriate tools/eqpt; if need be take advice from supervisor. Assist in completing documentation on prescribed formats/templates legibly and punctually. Assist in reporting defects and problems in time and escalate, if beyond his scope, as necessary 	<ul style="list-style-type: none"> Tower Crane with standard tools, accessories and equipment. Class room with audio-video system Manufacturers O and M Manual & Video Safety video PPE Items & Safety Gear Lab/workshop/ Covered Shed
4	<p>Comply with Worksite Health and Safety Guidelines</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 12:00</p> <p>Corresponding NOS Code</p>	<ul style="list-style-type: none"> Comply with all safety, health, security and environmental regulations and guidelines at the worksite Utilise Personal Protective Equipment (PPE) and other safety gear related to protection of body in an effective manner. Follow safety measures during operations to ensure that the health and safety of all including members of the publics is not at risk. Handle the transportation, storage and disposal of hazardous materials and waste in compliance with 	<ul style="list-style-type: none"> Tower Crane with standard tools, accessories and equipment. 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
	IES/N7601	<p>workshop health, safety and environmental guidelines</p> <ul style="list-style-type: none"> Operate various types and grades of fire extinguishers, as applicable to the different categories of equipment Support in administering basic first aid and report to concerned staff in case of an accident Respond promptly and appropriately to an accident/incident or emergency within limits of one's roles and responsibilities Record and report essential details related to operations, incidents or accidents as per the organisation's procedures. 	
	Total Duration Theory Duration 40:00 Practical Duration 80:00	Unique Equipment Required: <ul style="list-style-type: none"> Tower Crane with standard tools, accessories and equipment. Range of weighted loads with built in lifting hooks 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 Open ground and Lab/Workshop/Covered Shed 	

Grand Total Course Duration: **120 Hours, 0 Minutes**

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

Trainer Pre-requisites for Job role: “Junior Tower Crane Operator/ Signalman” mapped to Qualification Pack: “IES/Q0123, 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 “IES/Q 0123 Version 1.0”.
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 10 th
4a	Domain Certification	Certified for Job Role: “ <u>Junior Tower Crane Operator / Signalman</u> ” mapped to QP: “ <u>IES/Q 0123 – Version 1.0</u> ”. Minimum accepted score 70%.
4b	Platform Certification	Certified for Job Role: “ <u>Trainer</u> ” mapped to Qualification Pack: MEP/Q0102. Minimum accepted score 80%.
5	Experience	<ul style="list-style-type: none"> • 3 to 4 years’ site experience in Tower Crane Operations. • 1 to 2 years’ experience in conducting O and M training programs.

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Junior Tower Crane Operator/ Signalman

Qualification Pack Code IES/Q0123

Sector Skill Council IESC

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion
6. To pass the Qualification Pack, trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Compulsory NOS				Marks Allocation	
Total Marks: 100					
Assessment Outcomes	Assessment criteria for outcomes	Total Marks	Out Of	Theory	Skills Practical
1. IES/N0167 Assist in pre-lifting operations	PC1. check for availability of lifting gears, tools and tackles prior to starting lifting works	35	3	1	2
	PC2. select and use appropriate rigging gears required for heavy material shifting for structural components at construction site		4	1	3
	PC3. check and verify for appropriate rigging of the load to the sling as per the requirement of the load		3	1	2
	PC4. inspect wire rope slings, webbing slings and chain slings that may obstruct the lifting during crane operations		4	1	3
	PC5. check structural components of the equipment and assembly are placed away from any overhead power lines or service lines		4	1	3
	PC6. check work location for barricading, presence of signage and availability of required PPEs, provided as per standard practice		4	1	3

	PC7. ascertain weight of load and determine centre of gravity as per the weight of the load		3	1	2
	PC8. check for blind spots and estimate clearance of swing path on the site		4	1	3
	PC9. set up communications for safe lifting operation and test it with the crane operator		3	1	2
	PC10. prepare base for lifting equipment and load to be lifted as per requirement and instruction from the supervisor		3	1	2
	Total		35	10	25
2. IES/N0168 Assist in tower crane operations	PC1. analyse the load characteristics including centre of gravity and lifting points to determine the method of slinging	30	5	2	3
	PC2. communicate with the crane operator through lifting and manoeuvring the load using the communication device or by hand signalling		5	2	3
	PC3. determine and check the route of the load before and during the lift including distances, clearances and landing position		5	2	3
	PC4. ensure balance and stability of loads through constant observation of the load during the process		4	1	3
	PC5. coordinate with the crane operator and others on the worksite while the load is landing		4	1	3
	PC6. prepare base for unloading of materials along with the supervisor and other workmen at the worksite		4	1	3
	PC7. assist the site supervisor to cordon off lifting and lowering area using barricades, where applicable, according to lifting plan requirements		3	1	2
	Total		30	10	20
3. IES/N0169 Assist in regular maintenance of the tower crane	PC1. assist in replenishing coolants, lubricants and fluids as per the functioning of the machine or as per the operational manual	20	1.5	0.5	1
	PC2. assist in greasing all greasing pins, trolley pins, hoist and rope and slewing bolts regularly as per the usage of the machine		2	1	1

	PC3. service lubrications system, electrical service system, hoisting system and stabilizing system as per instructions of the operator/supervisor		2	1	1
	PC4. service Jib/boom and mast as per the instructions of the operator/supervisor		2	1	1
	PC5. check battery levels and condition of the terminals and carry out minor adjustments		2	1	1
	PC6. keep the tools in the designated place after usage as per the organizational guidelines		1.5	0.5	1
	PC7. ensure the main power is turned off from panel completely before carrying out maintenance work		1.5	0.5	1
	PC8. use appropriate tools while troubleshooting		1.5	0.5	1
	PC9. report defects precisely to the operator/supervisor if beyond scope of role		1.5	0.5	1
	PC10. dispose waste as per the guidelines of the site/ organization		1.5	0.5	1
	PC11. follow reporting procedures as laid down by the employer		1.5	0.5	1
	PC12. complete all documentation in the prescribed standards in a timely manner		1.5	0.5	1
	Total		20	8	12
4. IES/N7601 Comply with worksite health and safety guidelines	PC1. comply with safety, health, security and environment related regulations/ guidelines at the work site	15	1.5	0.5	1
	PC2. use Personal Protective Equipment (PPE) and other safety gear as applicable to the equipment and the worksite		2.5	0.5	2
	PC3. follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk		2	1	1
	PC4. carry out operations as per the manufacturer's and worksite related health and safety guidelines		1.5	0.5	1
	PC5. handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines		1.5	0.5	1
	PC6. operate various grades of fire extinguishers, as applicable		1.5	0.5	1

	PC7. support in administering basic first aid and report to concerned team members, as required, in case of an accident		1.5	0.5	1
	PC8. respond promptly and appropriately to an accident/ incident or emergency situation, within limits of role and responsibility		1.5	0.5	1
	PC9. record and report details related to operations, incidents or accidents, as applicable		1.5	0.5	1
	Total		15	5	10
	Grand Total		100	33	67