NSDA Reference
To be added by NSDA

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY

Name and address of submitting body:

Infrastructure Equipment Sector Council

23-29, FF5, First Floor, "White House Building"

St. Marks Road, (Opp SBI)

Bengaluru - 560001

Name and contact details of individual dealing with the submission

Name: Name: Col Krishna Vijay

Position in the organisation: Director NOS & Training

Address if different from above

Tel number(s) +91 80 4212 6666

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List of documents submitted in support of the Qualifications File

1. Annexure 1: Qualification Pack
2. Annexure 2: RFP for development of Occupational Standards
3. Annexure 3: Selection process of the Consultants to develop Occupational Standards
   - 3a. Minutes of the meeting of GC meetings
   - 3b. Composition of the Technical Committee
4. Annexure 4: Email approval of Occupational Standards by Technical Committee and Governing Council
5. Annexure 5: Occupational Analysis, List of companies and Industry associations participated in the development of these qualification packs (part of Occupational Analysis)
6. Annexure 6: List of QP/NOS validating companies
7. Annexure 7: NSDC QRC observation and feedback sheet
8. Annexure 8: Standard protocol for accreditation & assessments

QUALIFICATION FILE SUMMARY

Qualification Title	Qualification Pack- IES/Q0108- Hydra Crane Operator
Body/bodies which will assess candidates	Infrastructure Equipment Sector Council
Body/bodies which will award the certificate for the qualification.	Infrastructure Equipment Sector Council
Body which will accredit providers to offer the qualification.	Infrastructure Equipment Sector Council
Occupation(s) to which the qualification gives access	Equipment operations
Proposed level of the qualification in the NSQF.	4
Anticipated volume of training/learning required to complete the qualification.	120 Hours
Entry requirements / recommendations.	Preferably Class VIII
Progression from the qualification.	Supervisor (Plant and Machinery)
Planned arrangements for RPL.	Under Development
International comparability where known.	**Australian** CPC32912 Certificate III in Construction Crane Operations RIIHAN212D Conduct non-slewing crane operations RIIHAN310D Conduct crane operations underground TLI31710 Certificate III in Mobile Crane Operations TLI41910 Certificate IV in Mobile Crane Operations **Canada** NOC: 7371Mobile Crane Operator

Formal structure of the qualification

Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
IES/N0122 Carry out pre-operation checks on hydra crane	Mandatory	24	4
IES/N0123 Operate Hydra Crane	Mandatory	54	4
IES/N0124 Perform routine maintenance and troubleshooting of Hydra Crane	Mandatory	24	4
IES/N7601 Comply with worksite health and safety guidelines	Mandatory	18	3

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum or Qualification Pack.
Give details of the document here: **Qualification Pack is attached as Annexure**

SECTION 1

ASSESSMENT

Name of assessment body:
If there will be more than one assessment body for this qualification, give details.

CII

Will the assessment body be responsible for RPL assessment?

Give details of how RPL assessment for the qualification will be carried out and quality assured.

RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on 'learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria.
The assessment papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performance and assessment criteria mentioned in the Qualification Pack. The assessments papers are also checked for the various outcome based parameters such as quality, time taken, precision, tools & equipment requirement etc. The assessment sets are then reviewed by IESC official for consistency.
The assessments are designed so as to assess maximum parts during the practical hands on work. The technical limitations at the training centres are taken care in theory and viva. Criteria such as use of lift to pick heavy objects or selection of fire extinguisher during a fire are also assessed under theory/viva.
The assessment agencies are instructed to hire assessors with integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments. The assessment agencies are instructed to ideally have assessor with minimum 15 years industry experience as an ITI graduate / minimum 10 years' industry experience as diploma engineer and minimum 5 years' industry experience as graduate engineer.
The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to IESC Assessment Framework, competency based assessments, assessors guide etc.
The assessors are provided with assessors guide developed by the Subject Matter Expert of the assessment agency as per the assessment framework. The assessment guides are developed to ensure the maximum possible consistency in the assessment by different assessors and elaborate on the following

- Qualification Pack Structure
- Guidance for the assessor to conduct theory, practical and viva assessments
- Guidance for trainees to be given by assessor before the start of the assessments.
- Guidance on assessments process, practical brief with steps of operations practical observation checklist and mark sheet
- Viva guidance for uniformity and consistency across the batch.

The assessment by assessment agency will be completely based on the assessment criteria as mentioned in the Qualification Pack. Each NOS in the Qualification Pack (QP) will be assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Performance Criteria in the NOS will be assigned marks for or practical based on relative importance, criticality of function and training infrastructure.

The following tools are proposed to be used for final assessment:
Practical Assessment: This will comprise of a test hands on job to be prepared as per figure/engineering drawing by following appropriate working steps, using necessary tools, equipment and instruments.

Candidate's aptitude, safety consciousness, quality consciousness etc. will be ascertained by observation and

will be marked in observation checklist.

Viva/Structured Interview: This tool will be used to assess the conceptual understanding and the behavioural aspects as regards the job role and the specific task at hand. It will also include questions on safety, quality, environment, tools and equipment's etc.

Written Test: Under this test few key items which cannot be assessed practically will be assessed. The written assessment will comprise of
True / False Statements
Multiple Choice Questions
Matching Type Questions.

Optical Mark Recognition (OMR)/ Online System for this will be preferred.

Please attach any documents giving further information about assessment and/or RPL.
Give details of the document(s) here: Annexure 8

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Hydra Crane Operator

Qualification Pack IES/Q0108

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. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)

4. Individual assessment agencies will create unique evaulations for skill practical for every student at each examination/training center based on this criteria

5. To pass the Qualification Pack , every trainee should score a minimum of 50% aggregate
6. 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

		Marks Allocation			
Assessable Outcomes	**Assessment criteria for the outcome**	**Total Mark**	**Out Of**	**Theory**	**Practical**
IES/N0122 Carry	PC1. Adhere to time limits given by supervisor	45	2	0	2

out pre-operation checks on hydra crane	PC2. Inspect the crane body to ensure that the components are free of cracks and wear		3	1	2
	PC3. Checks that all decals are legible and in place as per operation manual		3	1	2
	PC4. Examine the hydraulic oil level to ensure no leaks and oil level are as per manufacturer's indicator		3	0	3
	PC5. Examine battery fluid to ensure proper fluid level as per manufacturer's indicator		3	0	3
	PC6. Check the tyre pressure and lug nut torque to make sure they are as per manufacturer's indicator		3	0	3
	PC7. Confirm for no engine oil leaks and proper fuel and fluid levels, as per manufacturer's indicator		3	0	3
	PC8. Check the holding and control breaks to ensure that they are functioning properly		3	0	3
	PC9. Get the following components checked for areas for damage, improperly installed or missing parts as per the manufacturer 's manual: • Electrical components, wiring and electrical cables • Hydraulic power unit, reservoir, hoses, fittings, cylinders and manifolds. • Tires and wheels • Trailer lights and reflectors • Parking brake, and electric braking system (including the breakaway system) • Drive wheel and motor		4	1	3
	PC10. Check to ensure that the following components as per operation manual: • Hoist • Wheels • Limit switches • Pins, nuts, bolts and other fasteners • Hitch components • Safety chains • Engines their fuel systems and related components • Hoist • Personal protective devices		4	1	3
	PC11. Check and ensure that all structural and other critical components are present as per operation manual		3	1	2
	PC12. Approve that all associated fasteners and pins are in place and properly tightened as per operation manual		2	0	2

	PC13. Inspect entire machine for: • Cracks in welds or structural components • Excessive rust, corrosion or oxidation • Dents or damage to machine		4	1	3
	PC14. Maintain a checking/maintenance logbook to record all activities performed before starting the excavator		2	0	2
	PC15. Report defects precisely to the supervisor if beyond scope of his role		3	1	2
		Total	**45**	**7**	**38**
IES/N0123 Operate Hydra Crane	PC1. Plan and organize the job according to given instructions	70	3	1	2
	PC2. Position the hook to attach sling, shackle and chains as per operation's manual		3	0	3
	PC3. Start the engine as per operation's manual		2	0	2
	PC4. Check the assembly and ensure that relevant safety measures as per safety guidelines taken		2	0	2
	PC5. Use the emergency stop button to disable all power to the hydra crane in case of a crisis, as per operator manual		3	1	2
	PC6. Ensure safe working load as per operation manual		2	0	2
	PC7. Check wind speeds are within the crane's operational limits		1	1	0
	PC8. Select the appropriate boom, jib, as per the load, site and lift conditions		3	0	3
	PC9. Ensure appropriate boom extension as per operation manual		3	1	2
	PC10. Hoist and release the load at a small height to check the holding and control breaks are functioning properly, ahead of the actual lifting		3	0	3
	PC11. Carry out lifting of load in coordination with rigger as per the requirement		3	0	3
	PC12. Monitor stability whilst moving a load		2	0	2
	PC13. Ensure good visibility of both ends of the crane arm at all times		2	0	2
	PC14. Ensure no obstacles, personnel or other obstructions during lifting operation		3	1	2
	PC15. Look out for people working and hazards such as trenches, potholes and cables		2	0	2
	PC16. Adhere to time limits given by the supervisors		2	0	2
	PC17. Perform in-operation visual checks on critical temperature and pressure gauges as per operation manual		2	0	2

	PC18. Select and use the right type of brake in different situations and conditions as per the operation manual		3	1	2
	PC19. Ensure that walkway rules e.g. operating the crane within the permissible/ allocated areas are followed		2	0	2
	PC20. Utilize judiciously various signaling devices available in the crane		2	0	2
	PC21. Keep a safe distance from other plant or vehicles		2	0	2
	PC22. Work safely in accordance with operational requirements and associated Safe Systems of Work		2	0	2
	PC23. Discharge the load safely at the position and in the manner designated by the supervisor		3	0	3
	PC24. Follow the instructions by the rigger		2	0	2
	PC25. Operate and control the boom and extensions as per operation manual		3	0	3
	PC26. Ensure lay down area is sufficient in size to accommodate load		2	0	2
	PC27. Ensure lay down area is clear of any obstruction and		2	0	2
	PC28. Ensure that no other operators travel on or stand near the Hydra Crane		2	0	2
	PC29. Inform supervisor/rigger of any problems while operating the Hydra Crane		2	0	2
	PC30. Shut down and secure the machine properly when it is unattended		2	0	2
		Total	**70**	**6**	**64**
IES/N0124 Perform routine maintenance and troubleshooting of Hydra Crane	PC1. Assess the right service schedule by tracking machine operating hours	60	3	1	2
	PC2. Check Crane Structure and the following accessories as per operation& maintenance manual		2	0	2
	PC3. Check Crane structure for deformed, cracked or corroded members in the structure and boom. • Loose bolts or rivets. • Excessive wear on brake and clutch system parts. • Deformed wedges. • Defective cotter keys, pins and guardrails.		4	1	3
	PC4. Check for the following in hydraulic system of Crane as per operation & maintenance manual: • Deterioration or leakage in air or hydraulic systems • Safe and effective operation on hoses, pumps and motors • Levels of fluid • Air cleaners for replacement or cleaning		4	1	3

	PC5. Check for the following Control Mechanisms and Monitoring Devices as per operation & maintenance manual • Cables, brakes and levers for poor adjustment or excessive wear. • Marking on the load/radius indicator over full range. • Load moment indicator, • Boom angle indicator, • Boom length indicator and • Anti two-block system		4	1	3
	PC6. Check wire ropes for wear and tear		2	0	2
	PC7. Check the following in the main boom as per operation manual • lift cylinder(s) • telescoping cylinder(s) • hydraulic hoses / tubing & fittings • holding device • boom sections alignment • auxiliary boom head structure		4	1	3
	PC8. Check the following in the Lattice boom extension • Boom • extension alignment • cords • lattices • end connections		4	1	3
	PC9. Replenish coolants, lubricants and fluids as per operation & maintenance manual		2	0	2
	PC10. Grease all greasing pins and pivot points as per operation & maintenance manual		2	0	2
	PC11. Check battery levels and condition of the terminals and carry out minor adjustments as per manufacturer's indicators		3	1	2
	PC12. Check and maintain the tire rims, air pressure, wheel nuts and treads as per manufacturer's indicators		3	0	3
	PC13. Track machine operating hours to assess the right service schedule		2	0	2
	PC14. Complete timely and legibly daily/ weekly maintenance sheets as provided by the company		2	0	2
	PC15. Ensure that suitable props/ support devices are used while performing maintenance		2	0	2
	PC16. Ensure that no maintenance task on the engine is performed when running or still hot		2	0	2
	PC17. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel		2	0	2

	PC18. Diagnose the problem		3	1	2
	PC19. Handle and dispose waste based on environmental guidelines at the work place		2	0	2
	PC20. Follow reporting procedures as laid down by the employer		2	0	2
	PC21. Complete all documentation in the prescribed standards in a timely manner		2	0	2
	PC22. Report and escalate problems/ incidents as required in a timely manner		2	0	2
	PC23. Report defects precisely to the supervisor if beyond scope of his role		2	0	2
		Total	60	8	52
IES/N7601 Comply with worksite health and safety guidelines	PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site	25	3	1	2
	PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection		3	0	3
	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		3	1	2
	PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines		3	1	2
	PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines		2	0	2
	PC6. Follow safety regulations and procedures with regard to worksite hazards and risks		2	0	2
	PC7. Operate various grades of fire extinguishers, as applicable		2	0	2
	PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		2	0	2
	PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		3	1	2
	PC10. Record and report details related to operations, incidents or accidents, as applicable		2	0	2
		Total	**25**	**4**	**21**

SECTION 2

EVIDENCE OF NEED

What evidence is there that the qualification is needed? (Annexure 4 &5) • Based on industry feedback and extrapolating from the data received from various visits and questionnaires we have arrived at roles which comprise of approximately 80% of the workforce in the infrastructure equipment sector across the respective sub-sectors undertaken in this study. • This have been prioritized keeping the following criteria in consideration: - High volumes of equipment sales - Inclusive of the critical roles captured in the feedback from the companies - Inclusive of the feedback received from the council members • Governing council of IESC gave final approval and endorsement for the same.
What is the estimated uptake of this qualification and what is the basis of this estimate? • Skills Gap analysis Reports for industry demand and secondary research data, though these do not lend to accurate demand projection. • Feedback from industry for demand though sample size may not lend to accurate figures • Training duration, and current and potential training capacity envisaged • As per industry practice 2 operators are required per equipment
What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF? • NSDC list of Approved and Under-Development QPs was checked prior to commissioning the work • Consultations with Construction Sector Skill Councils • NSDC QRC team also confirmed the same
What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? • Employer feedback will be sought post-placement • A formal review is scheduled in two year time

Please attach any documents giving further information about any of the topics above.
Give details of the document(s) here:
Annexure 4: Email approval of Occupational Standards by Technical Committee and Governing Council
Annexure 5: Section 3 and 4.1 of Occupational Analysis
Annexure 7: NSDC QRC observation and feedback sheet

SECTION 3

SUMMARY EVIDENCE OF LEVEL

Level of qualification:

Four

Summary of Direct Evidence (from learning outcomes):

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role

Summary of other evidence (if used):

Hydra Crane Operator - IES/Q0108					
Process Required	**Professional Knowledge**	**Professional Skill**	**Core Skill**	**Responsibility**	**Level**
Hydra Crane Operator is expected to conduct pre-operation checks on Hydra Crane, select the appropriate attachment for the job, operate the hydra crane as per the job and maintain the hydra crane. The activities identified are the ***familiar and routine activities*** for him as these activities are independent of job and worksite he is deployed on. Considering	Operator is expected to have ***knowledge of the functioning and operation*** of Hydra Crane ***Feature/specifications*** of the various attachment used and ***knowledge of hydra crane components, pre-operation checklist and routine maintenance*** Considering the in-depth **professional and factual knowledge**, which a Hydra Crane Operator has for hydra crane operation and maintenance this QP is pegged at Level 4.	Hydra crane ***identifies the appropriate attachment*** for various job like lift, move, position and reposition loads, etc. He ***checks the hydra crane for operation readiness*** using pre-operation checklist and ***conducts the routine maintenance*** covering levels of fluids, bolts, rivets, air filters, battery, tyre, body structure and keep the records as per the operations manual & standard operating	Operator is expected to be read and understand the various instrument panel, fluid levels and other indicators for pre-operation checks and routine maintenance. He has to select the appropriate lifting, moving, positioning and repositioning attachment based on the work site measurement and job requirement. All of this requires ***application of basic arithmetic principles*.** Operator has to continuously give and receive instruction and	The jobholder is responsible to: • Conduct pre-operation checks • Operate Hydra Crane • Conduct routine maintenanc e For each work site there can be variations in usage and operation of the Hydra crane. So the jobholder based on his ***own learning and experience***, identify appropriate attachment and operation process to maximize the productivity	4

the outcomes the job roles is pegged at level 04		procedures. Thus he is ***practically engaged*** in the hydra crane operation and maintenance.	guidance from co-workers on-site for moving the hydra crane and while lifting moving and positioning functions hence they are expected to be good in ***communication skills***. Jobholder is expected to conduct themselves in ways, which show a basic understanding of the ***social and professional environment of working at construction, mining or other sites***	efficiently. He is continuously engaged in the ***self-learning process*** and he has the ***responsibility for own*** work. Jobholder is majorly responsible for his own job and self-learning process which justifies the pegging of the QP at level 4 and not directly involved in some learning of others (which is a requirement for Level 5). In his routine activity he is free from supervision (which is a requirement of level 3).	
Level 4	Level 4	Level 4	Level 4	Level 4	

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

While designing the national occupational standards, occupational mapping was done on a large sample size and validated across the country. The career progression for roles in each occupation was also analysed and decided, based on industry validation across the country. The current challenges faced by the industry, at large, was also kept in mind.

Please attach any documents giving further information about any of the topics above.
Give details of the document(s) here:

- Annexure 5: Section 5 of Occupational Analysis
- List of companies and Industry associations participated in development of these qualifications (part of OA)