

Revised Application Documentation: Revision made by NSDA_25 May 2015

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY

Name and address of submitting body:

Infrastructure Equipment Sector Council

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St. Marks Road, (Opp SBI)

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Name and contact details of individual dealing with the submission

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Position in the organisation: Director NOS & Training

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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/Q1201- Supervisor Maintenance (Infrastructure Equipment)		
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	Supervisory role in Equipment Operations		
Proposed level of the qualification in the NSQF.	7		
Anticipated volume of training/learning required to complete the qualification.	120 Hours		
Entry requirements / recommendations.	Preferably Diploma in Mechanical/ Electrical/ Automobile Engineering		
Progression from the qualification.	Nil, Will be developed in next phase		
Planned arrangements for RPL.	Under Development		
International comparability where known.	European, Australian and Canadian NOSs, No direct comparability established.		
Formal structure of the qualification			
Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
IES/N1201 Supervise preventive maintenance and minor repair work	Mandatory	54	7
IES/N1202 Supervise corrective maintenance of equipment	Mandatory	48	7
IES/N7602 Comply with workshop 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 Supervisor Maintenance (Infrastructure Equipment)

Qualification Pack IES/Q1201

Sector Skill Council Infrastructure Equipment

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 evaluations 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

Assessable Outcomes	Assessment criteria for the outcome	Marks Allocation			
		Total Marks	Out Of	Theory	Practical
1. IES/N1201 Supervise preventive maintenance and minor repair work	PC1. Create the preventive maintenance schedule and checklists as per parts and maintenance checklist	70	3	0	3
	PC2. Communicate maintenance plan to all the stakeholders like Site Supervisor/ Project Manager/ Maintenance Manager/ labor in-charge/ Material Manager/ Contract labor etc as per organizational protocol		4	1	3
	PC3. Arrange for procurement of machine / equipment parts whenever necessary as per organization protocol		3	0	3
	PC4. Arrange availability of hardware for repair work or raise indent for the same much before the preventive maintenance schedule		4	1	3
	PC5. Plan and schedule availability of mechanics, technicians, labor in adequate numbers to carry out preventive maintenance		3	0	3
	PC6. Inspect and validate if all the tools used to monitor the functioning of the equipment are calibrated and certified by competent authority		4	1	3
	PC7. Assist in planning and operationalization of the field workshop/ service, as		3	0	3

	required				
	PC8. Supervise equipment commissioning/ installation process		2	0	2
	PC9. Comply with all organizational guidelines, SHE policy and quality standards during equipment maintenance		4	1	3
	PC10. Supervise the enforcement of all SHE related guidelines in equipment maintenance		2	0	2
	PC11. Carry out periodic walk-throughs to ensure that the service/ field workshop area is clean and free from hazards as per the Safety, Health and Environmental policy/ guidelines		3	1	2
	PC12. Supervise the handling and disposal of waste based on environmental guidelines at the work place		2	0	2
	PC13. Share equipment wise checklists and work schedule with the mechanics to ensure correct type of service (daily, weekly, monthly, quarterly, half yearly and yearly)/ maintenance activities are completed		3	1	2
	PC14. Assist the manager in monitoring maintenance operations with regards to timelines and budgets		2	0	2

	PC15. Ensure that third party equipment installed at the work place undergo preventive maintenance as per agreed schedule/ annual maintenance contract with the vendor		3	1	2
	PC16. Help and guide the mechanics, as required		2	0	2
	PC17. Check the workmanship of mechanics/ technicians and other personnel		2	0	2
	PC18. Ensure the faulty parts are replaced/ repaired on the site or sent to vendor for repair through Material department		3	1	2
	PC19. Ensure quality of workmanship of mechanics and enter the same in daily report		3	1	2
	PC20. Assist the workshop/ P&M manager in ensuring the quality of workmanship of third party vendors		2	0	2
	PC21. Check if the preventive maintenance work is complete as per the checklists given to all the mechanics		2	0	2
	PC22. Get a sign-off from the end user of the equipment like Site Engineer and/ or Project Head as per organizational protocol		3	1	2
	PC23. Document the details of the vendors in log-books/ organizational reports/ MIS/ vendor's worksheets etc. as per organizational protocol		3	0	3

	PC24. Complete documentation applicable to the role like reports, preventive maintenance log-books, spare parts usage log-books, sign-off reports, management Information Reports, and other reports as per the quality & reporting standards applicable to the organization		3	0	3
	PC25. Keep all the records in a way and at a place where it is easily accessible to the relevant personnel		2	0	2
		Total	70	10	60
2. IES/N1202 Supervise corrective maintenance of equipment	PC1. Formulate in consultation with the P&M/ Workshop Maintenance Manager the system of maintenance cycle for Plant & machinery (P&M)	50	3	0	3
	PC2. Divide the manpower of mechanics and other support personnel into teams and make them responsible for planned and unplanned work, based on the frequency and severity of breakdowns		3	0	3
	PC3. Plan for natural and manmade contingencies		4	1	3
	PC4. Create a predictive tests and analysis such as pressure , temperature, wear & tear checks, oil leakage test, hydraulic systems check, engine stress and gas exhaust system tests, wire life assessments etc. in consultation and advice of		4	1	3

	manage				
	PC5. Provide data to manager about key performance parameters (like mean time between break-downs, cost of maintenance, power consumption, water consumption, oil and gas consumption, manpower utilization etc) as per CMA procedures		4	1	3
	PC6. Design a system by which the supervisor is informed about the break as soon as it occurs		4	1	3
	PC7. Identify the problem quickly by performing diagnostic breakdown analysis, study the equipment manuals		4	1	3
	PC8. Cordon off the area, switch off power source, move personnel to safe area, in-case of an emergency		4	1	3
	PC9. Deploy mechanics to address the break down, as per organization protocols		2	0	2
	PC10. Take immediate action so that the break down is rectified.		2	0	2
	PC11. Run the equipment after the repair to ensure its working appropriately and safely		3	1	2

	PC12. Note down all the critical parameters of performance of the equipment post repair		3	1	2
	PC13. Take sign off from Production/ Operation/ Project Manager under whose jurisdiction the equipment is working.		3	1	2
	PC14. Give information and data to Manager so as to make changes, if any, in the preventive maintenance schedule		3	1	2
	PC15. Ensure all the relevant stakeholders are informed about the rectification		2	0	2
	PC16. Ensure entries are made in log-books, ERP, and other organization specified reports		2	0	2
		Total	50	10	40
3. IES/N7602 Comply with workshop health and safety guidelines	PC1. Comply with safety, health, security and environment related regulations/ guidelines as per organizational/ manufacturer's policy		2	0	2
	PC2. Carry out maintenance operations as per the manufacturer's and workshop related health and safety guidelines/ standard operating procedures	30	3	1	2
	PC3. Follow safety regulations and procedures with regard to service workshop hazards and risks		2	0	2

	PC4. Use appropriate protective clothing/ equipment for specific tasks and work conditions as per service manual		3	1	2
	PC5. Lift and carry tools/equipment/components safely using correct procedure as per the service manual		3	1	2
	PC6. Use appropriate tools in a proper manner as given in the service manual		2	0	2
	PC7. Keep the work area free from clutter and spillage		3	1	2
	PC8. Store equipment and tools back at designated place post use and inspect to make sure they are not left behind		1	0	1
	PC9. Handle the storage and disposal of hazardous materials and waste in compliance with health, safety and environmental guidelines		4	1	3
	PC10. Operate various grades of fire extinguishers, as applicable		3	0	3
	PC11. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		1	0	1
	PC12. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		1	0	1

	PC13. Record and report details related to operations, incidents or accidents, as applicable		2	0	2
		Total	30	5	25

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

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:

Seven

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):

Supervisor Maintenance (Infrastructure Equipment) - IES/Q1201					
Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility	Level
<p>Supervisor maintenance is expected to overall manage and supervise the service workshop and ensure functional equipment fleet for deployment</p> <p>He has to plan, and schedule the routine maintenance and preventive maintenance of the equipment. And response to exigencies in case of breakdown of equipment</p> <p>He has to monitor and</p>	<p>Supervisor maintenance is expected to have knowledge of the functioning and specifications of various infrastructure equipment. Knowledge of planning and scheduling for routine maintenance.</p> <p>He has to have in depth understanding of the concept of productivity and quality systems and how to monitor the same</p> <p>Considering the in-depth professional and factual knowledge of the broad contexts, which a supervisor has for supervision of the equipment maintenance this QP is pegged at Level 07.</p>	<p>Supervisor maintenance identifies the appropriate resources for the maintenance work based on the type of maintenance required</p> <p>He has to monitor and track the maintenance and create mitigation plan in case of downtime</p> <p>He has to take appropriate steps to increase productivity and efficiency</p> <p>Thus he is practically engaged in the equipment</p>	<p>Supervisor is expected to be support mechanics for major faults by diagnosis and probable solutions</p> <p>He has to create predictive tests and analysis of the same in consultation with superiors</p> <p>He has to collect relevant information from others to generate plan and schedule of activity.</p> <p>Supervisor has to continuously give and receive instruction and guidance from superiors and</p>	<p>The jobholder is responsible to:</p> <ul style="list-style-type: none"> Supervise preventive maintenance and repairs Supervise corrective maintenance Develop Manpower deployed for equipment operations <p>Supervisor maintenance is fully responsible for the equipment maintenance and readiness of the fleet on worksite.</p> <p>Jobholder is responsible for overall</p>	7

<p>assist workshop manager in ensuring effectiveness and quality of the maintenance work.</p> <p>He has to formulate the periodic maintenance system in consultation with P&M dept.</p> <p>Supervises the worksite Safety, Health, environment and quality guidelines for workshop</p> <p>The activities identified requires command of wide range specialised theoretical and practical skills with varying routine</p> <p>Considering the outcomes the job roles is pegged at level 07</p>		<p>maintenance and crisis management in case of emergencies.</p>	<p>juniors in the workshop for smooth maintenance hence they are expected to be good in communication skills.</p> <p>Jobholder is expected to conduct themselves in ways, which show a basic understanding of the social and professional environment of working at workshop</p>	<p>maintenance of equipment fleet efficiently on worksite and the development of the manpower engaged in maintenance and not directly involved in management of unpredictable crises (which is a requirement for Level 8).</p> <p>In his routine work he is not only responsible for his own work and learning but fully responsible for the team output and team develop (which is a requirement of level 6).</p>	
Level 7	Level 7	Level 7	Level 7	Level 7	

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)