

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

NSDA Reference

To be added by NSDA

Name and address of submitting body:

Infrastructure Equipment Sector Council

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Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Annexure 1: Qualification Pack
2. Annexure 2: IESC & LabourNet Agreement for development of Occupational Standards
3. Annexure 3: Approval of GC on the classification of small, medium and large companies for NOS development
4. Annexure 4: GC resolution for formation of NOS Sub-committee
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

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SUMMARY

Qualification Title	Hot Mix Plant Operator		
Qualification Code	IES/Q0114		
Nature and purpose of the qualification	<p>Nature of Qualification</p> <ul style="list-style-type: none"> • Qualification Pack <p>Purpose of Qualification</p> <p>To enable candidate to become a Hot Mix Plant Operator</p>		
Body/bodies which will award the qualification	Infrastructure Equipment Sector Council		
Body which will accredit providers to offer courses leading to the qualification	Infrastructure Equipment Sector Council		
Body/bodies which will carry out assessment of learners	Infrastructure Equipment Sector Council		
Occupation(s) to which the qualification gives access	Equipment operations- Hot Mix Plant Operator		
Licensing requirements	N/A		
Level of the qualification in the NSQF	4		
Anticipated volume of training/learning required to complete the qualification	208 Hours		
Entry requirements and/or recommendations	Preferably Class VIII		
Progression from the qualification	Senior Hot Mix Plant Operator		
Planned arrangements for the Recognition of Prior learning (RPL)	Presently the industry has a large work force of operators and mechanics who are trained and experienced but not certified as per the NSQF norms. It is proposed to certify them under the RPL (Recognition of Prior Learning) program which will go a long way in facilitating their career progression.		
International comparability where known	<p>US- Asphalt Plant Operator I- Classification Specification 600801</p> <p>The standard is about operating and maintaining the asphalt plant and performing major and minor repairs on the equipment. It specifies design, mixes and tests on asphalt blends.</p>		
Date of planned review of the qualification.	30/04/18		
Formal structure of the qualification			
Title of component and identification code.	Mandatory/ Optional	Estimated size (learning)	Level

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		hours)	
IES/N0119 Carry out pre-operation checks on a hot mix plant	M	32	4
IES/N0120 Carry out hot mix plant operations	M	102	4
IES/N0121 Carry out routine maintenance and troubleshooting of the hot mix plant	M	42	4
IES/N7601 Comply with worksite health and safety guidelines	M	32	4

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum Document or a Qualification Pack.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information. Qualification Pack is attached as Annexure 1

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SECTION 1 **ASSESSMENT**

Body/Bodies which will carry out assessment:

Confederation of Indian Industries (CII)

How will RPL assessment be managed and who will carry it out?

RPL program is designed to assess and certify those personnel with the requisite qualifications and experience. In the first step, individuals are screened and assessed, both through theory and practical tests, based on the same Assessment Criteria of the approved Qualification Pack. The skill gaps are thus identified and individuals undergo 'bridge training' as applicable. Then at the end of the short course they are finally assessed and certified.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable 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 to assess the conceptual understanding, 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

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assessment based on the criticality of the NOS- unique (functional)/ common NOS for job roles at the same levels. 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:

Each NOS in the QP will be assigned a relative weightage for assessment based on the functional importance of each. Further each Performance Criteria in the NOS will be assigned marks based on relative functional importance; which is in turn divided into theory and practical assessment. Overall practical constitutes 70% and written 30% of total marks.

Viva/Structured Interview: This tool will be used to assess select conceptual understandings related to practical handling of equipment and procedures with specific tasks at hand; and behavioral aspects of the job role. It will also include questions on tools & equipment; safety and environment

Written Test: This tool will be used to assess general conceptual knowledge / understanding and other aspects of the job role which are either not feasible or difficult to assess practically. 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.

ASSESSMENT EVIDENCE

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Hot Mix Plant Operator

Qualification Pack IES/Q0114

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 40% in each NOS and 60% 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.

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Assessment Outcomes	Assessment Criteria for the outcome	Total Mark	Marks Allocation		
			Out Of	Theory	Skills Practical
1. IES/N0119_Carry out pre-operation checks on a hot mix plant	PC1. Conduct visual inspection around the hot mix plant for oil leaks in different parts of the plant	30	2	1	1
	PC2. Check for various electrical connection including the motors used in the plant		1	0	1
	PC3. Ensure the conveyor belts is in proper working condition as per the manufacturer's instructions		2	1	1
	PC4. Check if the roller filters are free of impurities		2	0	2
	PC5. Check whether the bolts and other valves are appropriately fixed		2	1	1
	PC6. Ensure that the power generator has enough amount of diesel as per the plant requirement		1	0	1
	PC7. Inspect all incoming electrical connections and the motors in the plant		2	1	1
	PC8. Check panel to ensure that controls are in correct position for starting		2	0	2
	PC9. Check if the fuel and lubricant levels in the burners is as per the requirement		2	1	1
	PC10. Visually check the cabin for any obstructions		1	0	1
	PC11. Check monitoring and warning systems as per the operational manual		2	1	1

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	PC12. Ensure that the required amount and size of course aggregate and gravels are present in the hoppers		2	1	1
	PC13. Check if the quantity of the bitumen in the plant is as per the requirement of the mix design		1	0	1
	PC14. Ensure all the hoppers are clear and free from the obstructions		2	0	2
	PC15. Maintain a checking/maintenance logbook to record all activities performed before starting the compactor		2	1	1
	PC16. Maintain a checking/maintenance logbook to record all activities performed before starting the operation		2	1	1
	PC17. Report defects precisely to the supervisor if beyond scope of the role		2	0	2
		Total	30	9	21
2. IES/N0120 Carry out hot mix plant operations	PC1. Heat the pipeline of the bitumen before starting the operation to clear the residual from previous operations	35	1	0	1
	PC2. Heat the bitumen 12 hours before mixing at a temperature of 150-160 degrees Celsius or as per the manufacturer's instructions		1	0	1
	PC3. Turn on the exhaust motor to clear the dust from the filler elevators as per the set procedures		2	1	1
	PC4. Turn on the power generator switch to supply power to the hot mix plant		0.5	0	0.5
	PC5. Turn on the hot mix plant by pressing on the appropriate switches		2	1	1

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	PC6. Test run the hot mix plant for checking the normal functioning		1	0	1
	PC7. Ensure there is enough heated bitumen in the tank by checking on the control panel		1	0	1
	PC8. Feed the numeric data and operational data into a computer system for asphalt plant production activities as per the mix design		0.5	0	0.5
	PC9. Turn on the hot mix plant as per the manufacturer's instructions		2	1	1
	PC10. Start components in correct order manually or through computer controls		1	0	1
	PC11. Ensure proper flow of materials into the mixing drum visually and by monitoring the indicators on the control panel		1	0	1
	PC12. Control the speed and flow of different materials in the drum as per the required output		1.5	1	0.5
	PC13. Observes gauges, dials, and operation of machinery to ensure conformance to processing specifications.		2	1	1
	PC14. Monitor the temperature of the bitumen regularly by checking the indicators on the control panel		0.5	0	0.5
	PC15. Coordinate with the co-workers to ensure regular supply of raw materials in the appropriate hoppers		2	1	1
	PC16. Ensure removal of obstructions if any during the operations		1	0	1

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	PC17. Ensure water supply in the mixing drum and pollution bank as per the manufacturer's instructions		1	0	1
	PC18. Check the output is as per the mix design/ customer requirements		1.5	1	0.5
	PC19. Monitor the weigh hopper for appropriate flow of output		1	0	1
	PC20. Ensure proper flow of hot mix in hot mix surge silo as per the requirement		2	1	1
	PC21. Coordinate with the vehicle operators for collecting the output		1	0	1
	PC22. Monitor for proper functioning of the hot mix plant as per the requirement		0.5	0	0.5
	PC23. Turn off the plant operation during emergencies by pressing the emergency switch button		1	0	1
	PC24. Inform supervisor of any problems while operating the hot mix plant		2	1	1
	PC25. Wear dust masks when working around the plant		1	0	1
	PC26. Make positive eye contact with other equipment operators at the site before crossing in front of or behind the equipment		1	0	1
	PC27. Wear all PPE while sampling asphalt binder and for all operations		1	0	1
	PC28. Record input and output flow as per the desired formats of the organization		2	1	1
		Total	35	10	25

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3. IES/N0121_Carry out routine maintenance and troubleshooting of the hot mix plant	PC1. Assess the right service schedule by tracking machine operating hours	20	2	1	1
	PC2. Arrange for and perform scheduled maintenance, such as replace worn parts such as belts, roller bearings, etc.		1	0	1
	PC3. Perform basic maintenance, such as change spark plug, grease controls, cleaning of conveyor belts		1	0	1
	PC4. Check bearings at the burner end of the slinger conveyor for excessive heating		1	0.5	0.5
	PC5. Replenish coolants, lubricants and fluids regularly as per the manufacturer's instructions		2	1	1
	PC6. Change filter, clean and change flame-eye regularly as per the operating hours/ manufacturer's instructions		1	0	1
	PC7. Inspect silos, fuel tanks for leaks or scattering of concrete or limestone regularly		0.5	0	0.5
	PC8. Lubricate all pins and pivot points regularly as per the machine manuals/manufacturer's instructions		2	1	1
	PC9. Check battery levels and condition of the terminals and carry out minor adjustments if required		1	0	1
	PC10. Identify service needs, defects, and hazardous conditions through visual inspection		1	0	1

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	PC11. Arrange for and assist repair or replacement of defective components, such as motor, burner, temperature control		2	1	1
	PC12. Read indicators that signal need for replacement, such as air filter on compressor		1.5	0.5	1
	PC13. Identify missing or defective components or controls as per the equipment drawings		0.5	0	0.5
	PC14. Comply with safety requirements, such as confined space, lock-out procedures		1.5	0.5	1
	PC15. Maintain records and documentation relating to service, such as log books, repair lists, etc.		1	0	1
	PC16. Follow reporting procedures as laid down by the employer		1	0.5	0.5
		Total	20	6	14
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	2	1	1
	PC2. Use Personal Protective Equipment (PPE) and other safety gear as applicable to the equipment and the worksite		1	0	1
	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		2	1	1

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	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. Operate various grades of fire extinguishers, as applicable		1	0	1
	PC7. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		2	1	1
	PC8. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		1	0	1
	PC9. Record and report details related to operations, incidents or accidents, as applicable		2	1	1
		Total	15	5	10

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SECTION 2

EVIDENCE OF LEVEL

Title/Name of qualification/component: Hot Mix Plant Operator			Level: 4
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
Process	Hot Mix Plant Operator is expected to conduct pre-operation checks on Hot Mix Plant, select the appropriate attachment for the job, operate the hot mix plant as per the job and do basic maintenance	The activities identified are the familiar and routine activities for him as these activities are independent of job and worksite he is deployed on, for e.g.: bitumen and temperature checks, clearing hoppers of unwanted materials, conducting test runs, etc. Considering the outcomes the job roles is pegged at level 04	4
Professional knowledge	Operator is expected to have knowledge of the functioning and operation of Hot Mix Plant. Feature/specifications of the various attachment used and knowledge of hot mix plant components, pre-operation checklist and routine maintenance	Considering the in-depth professional and factual knowledge , which a Hot Mix Plant operator has for hot mix plant operation and maintenance such as components of hot mix plant, basics and engine motors, aggregates, instrument panel, etc. Therefore this QP is pegged at Level 4.	4
Professional skill	Hot Mix Plant Operator identifies the appropriate attachment for various job like feeding, drum mixing, conveying, etc.; temperature requirements, material flow, etc. He checks the Hot Mix Plant for operation readiness using pre-operation checklist and conducts the routine maintenance covering lubrication, oil levels, coolant, air filters, motors, tyre, body structure, conveyor belts checks and keep the records as per the operations manual & standard operating procedures.	He is practically engaged in the hot mix plant operation and maintenance. The major skills required are recording of deviations, comprehension of sign symbols, communication, etc. Therefore the QP is set at level 4	4
Core skill	Operator is expected to read and understand the various instrument panel, fluid levels and other indicators for pre-operation checks and routine maintenance. He has to set	Operator has to continuously give and receive instructions and guidance from co-workers on-site for starting and stopping the hot mix plant hence they are expected to be good in	4

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Title/Name of qualification/component: Hot Mix Plant Operator		Level: 4	
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
	right temperature during the mixing process. All of this requires application of basic arithmetic principles .	<p>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 construction, mining or other sites</p>	
Responsibility	<p>The jobholder is responsible to:</p> <ul style="list-style-type: none"> • Conduct pre-operation checks • Operate hot mix plant • Conduct routine maintenance • Comply with worksite health and safety <p>For each work site there can be variations in usage and operation of the hot mix plant. So the jobholder based on his own learning and experience, identify appropriate attachment and operation process to maximize the productivity efficiently. He is continuously engaged in the self-learning process and he has the responsibility for own work.</p>	<p>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 responsible for 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).</p>	4

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SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

The job roles have been formulated based on 'occupational mapping and functional analysis' involving manufacturers and customers/ end users of the infrastructure equipment sector products. Further these have been validated by all segments of the industry i.e. small, medium and large customers. The methodology / questionnaire and certificates in support for all have been enclosed.

What is the estimated uptake of this qualification and what is the basis of this estimate?

The Occupational Analysis Report in support of these job roles has taken into account the industry growth and expected demand over the coming years. These statistics and other details have been covered in depth under the relevant sections of the same.

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 Skill Councils for Construction and Mining Sector
- 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 years time

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

Annexure 5: Section 3 and 4.1 of Occupational Analysis

Annexure 7: NSDC QRC observation and feedback sheet

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SECTION 4

EVIDENCE OF 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.

Hot Mix Plant Operator (Level 4) > Senior Hot Mix Plant Operator (Level 5) > Master Operator/Trainer Operator (Level 6) > Supervisor (Level 7)

**Level= NSQF level*

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

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