

## NSQF QUALIFICATION FILE

Approved in 22<sup>nd</sup> NSQC Meeting, 19<sup>th</sup> December 2018

### CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

#### **Name and address of submitting body:**

Infrastructure Equipment Skill Council  
No 6, Avik Royale, 50 Feet Main Road,  
Avalahalli Extension, Girinagar  
Bengaluru 560 026

#### **Name and contact details of individual dealing with the submission**

**Name:** Col. Krishna Vijay

**Position in the organisation:** Director, Standards and QA

**Address if different from above:** Same as above

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#### **List of documents submitted in support of the Qualifications File**

1. Qualification Pack
2. Model Curriculum
3. Functional Analysis
4. Occupational Map
5. Approval from the Line Ministry
6. Industry Validations
7. NSQC Summary Sheet
8. NSQC Presentation

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- SUMMARY

1	<b>Qualification Title</b>	Junior Borewell Drilling Machine Operator
2	<b>Qualification Code, if any</b>	IES/Q0125
3	<b>NCO code and occupation</b>	NCO-2015/ 8113.0800 Well Driller, Machine (Other than Petroleum and Gas)
4	<b>Nature and purpose of the qualification (Please specify whether qualification is short term or long term)</b>	<p><b>Nature of Qualification</b></p> <ul style="list-style-type: none"> <li>- Qualification Pack</li> </ul> <p><b>Purpose of Qualification</b></p> <ul style="list-style-type: none"> <li>- To enable candidate to become a Junior Borewell Drilling Machine Operator</li> </ul>
5	<b>Body/bodies which will award the qualification</b>	Infrastructure Equipment Skill Council
6	<b>Body which will accredit providers to offer courses leading to the qualification</b>	Infrastructure Equipment Skill Council
7	<b>Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)</b>	Yes, Copy Attached
8	<b>Occupation(s) to which the qualification gives access</b>	Equipment operations- Junior Borewell Drilling Machine Operator
9	<b>Job description of the occupation</b>	A junior bore well drilling machine operator assists in setting up and guides the operator in operating portable drilling rig to drill wells. He helps in starting and controlling the drilling actions by assisting in lowering of well casing into the well bore
10	<b>Licensing requirements</b>	N/A
11	<b>Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)</b>	N/A
12	<b>Level of the qualification in the NSQF</b>	3
13	<b>Anticipated volume of training/learning required to complete the qualification</b>	120 hours
14	<b>Indicative list of training tools required to deliver this qualification</b>	<ul style="list-style-type: none"> <li>• Operational Borewell</li> <li>• Other items as listed in the model curriculum</li> </ul>
15	<b>Entry requirements and/or recommendations and minimum age</b>	Class VIII
16	<b>Progression from the</b>	Borewell Drilling Machine Operator

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	<b>qualification (Please show Professional and academic progression)</b>		
17	<b>Arrangements for the Recognition of Prior learning (RPL)</b>	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	
18	<b>International comparability where known (research evidence to be provided)</b>	<p><b>UK NOS COGODR12- Support Drilling Operations</b> The standard is about variety of drilling operations including the preparation of the drill floor, make up and delivery of stands and the running of the shale shakers</p> <p><b>UK NOS COGODR16- Control the drilling process</b> The standard is about directing the operation of drilling equipment and maintaining drilling parameters</p>	
19	<b>Date of planned review of the qualification.</b>	26/12/20	
20	<b>Formal structure of the qualification</b>		
	<b>Mandatory components</b>		
	<b>Title of component and identification code/NOSs/Learning outcomes</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
(i)	IES/N0173 Assist in carrying out pre-operation checks on bore well drilling equipment	24	3
(ii)	IES/N0174 Assist in bore well drilling operations	54	3
(iii)	IES/N0175 Assist in regular maintenance of the bore well drilling equipment	24	3
(iv)	IES/N7601 Comply with worksite health and safety guidelines	18	3
	<b>Sub Total (A)</b>	<b>120</b>	
	<b>Optional components</b>		
	<b>Title of component and identification code/NOSs/</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>

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	<b>Learning outcomes</b>		
	<b>Sub Total (B)</b>		
<b>Total (A+B)</b>		<b>120</b>	

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### **SECTION 1** **ASSESSMENT**

21	<b>Body/Bodies which will carry out assessment:</b> Confederation of Indian Industries (CII))
22	<b>How will RPL assessment be managed and who will carry it out?</b> 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.
23	<b>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.</b> 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

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	<p>consistency in the assessment by different assessors and elaborate on the following</p> <p>Qualification Pack Structure</p> <p>Guidance for the assessor to conduct theory, practical and viva assessments</p> <p>Guidance for trainees to be given by assessor before the start of the assessments.</p> <p>Guidance on assessments process, practical brief with steps of operations</p> <p>practical observation checklist and mark sheet</p> <p>Viva guidance for uniformity and consistency across the batch.</p> <p>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- 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.</p> <p>The following tools are proposed to be used for final assessment:</p> <p>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.</p> <p><u>Viva/Structured Interview:</u> This tool will be used to assess select conceptual understandings related to practical handling of equipment and procedures with specific tasks at hand; and behavioural aspects of the job role. It will also include questions on tools &amp; equipment; safety and environment</p> <p><u>Written Test:</u> 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</p> <ul style="list-style-type: none"><li>True / False Statements</li><li>Multiple Choice Questions</li><li>Matching Type Questions.</li></ul> <p>Optical Mark Recognition (OMR)/ Online System for this will be preferred.</p>
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Please attach most relevant and recent documents giving further information about assessment and/or RPL.

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

**ASSESSMENT EVIDENCE**

**Complete a grid for each component as listed in “Formal structure of the the qualification” in the Summary.**

*NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – ie Learning Outcomes to be assessed, assessment criteria and the means of assessment.*

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**24. Assessment evidences**

**CRITERIA FOR ASSESSMENT OF TRAINEES**

**Job Role** Junior Bore Well Drilling Machine Operator

**Qualification Pack Code** IES/Q0125

**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

<b>Compulsory NOS</b>				<b>Marks Allocation</b>	
<b>Total Marks: 100</b>					
<b>Assessment Outcomes</b>	<b>Assessment Criteria for Outcomes</b>	<b>Total Marks</b>	<b>Out Of</b>	<b>Theory</b>	<b>Skills Practical</b>
1. IES/N0152 Assist in carrying out pre-operation checks on bore well drilling equipment	PC1. check for tires-damages and bulges and report to the operator/ supervisor	<b>35</b>	3	1	2
	PC2. check for wheels, loose lug bolts, bent rims, cracks as per instructions from the operator/ supervisor		3	1	2



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	PC3. tightening of bolts as per the instructions from the operator/supervisor	1.5	0.5	1
	PC4. assist operator in checking fluid levels of engine crank case, radiator coolant and battery electrolyte	1.5	0.5	1
	PC5. check for drill rods availability as per the drilling requirements or as per instructions from the operator/supervisor	3	1	2
	PC6. check for the diesel availability and if needed, report to the operator	3	1	2
	PC7. operate jacks to level the vehicle if needed use wooden jacks as per the instructions from the operator	3	1	2
	PC8. tighten all the pipes, valves and bolts before running the machine as per operator's instructions	2.5	0.5	2
	PC9. connect the oil pipe to the main machine (which contains rig mast) that is used for hammer lubrication as directed by the operator	3	1	2
	PC10. check the availability of tools required to maintain the machine	3	1	2
	PC11. assist the operator in servicing the hammer before connecting it to the mast	1.5	0.5	1
	PC12. polish the drill bit for better drilling as per instructions from the operator	2	1	1
	PC13. assist in cleaning the area to level the surface for performing drilling	2	1	1
	PC14. report defects precisely to the operator/ supervisor if beyond scope of the role	1.5	0.5	1
	PC15. assist in maintaining a checking/maintenance logbook to record all activities performed before starting the paver operation	1.5	0.5	1
	<b>Total</b>	<b>35</b>	<b>12</b>	<b>23</b>

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2. IES/N0153 Assist in bore well drilling operations	PC1. pick up required material or equipment from storage and place them near the drilling area	30	3	1	2
	PC2. grease the drill rods as per the instructions from the operator/supervisor		3	1	2
	PC3. assist the operator in placing casing pipe and connecting drill rods to the rotate motor		3	1	2
	PC4. assist the operator in monitoring RPM, air discharge temperature and pressure, engine water temperature and pressure and sump pressure displayed in the compressor unit		3	1	2
	PC5. check the engine oil regularly in two machines i.e. main truck and the supporting truck		3	1	2
	PC6. assist the operator in adding fluids, coolants and fuel into the equipment		3	1	2
	PC7. monitor the drilling operation when the operator is not around the equipment		3	1	2
	PC8. clean the area regularly while drilling is in process as per instructions from the operator/supervisor		3	1	2
	PC9. place the tools and other parts at its place when drilling is completed		3	1	2
	PC10. assist the operator in recording the drilling process as per the organization standards		3	1	2
	<b>Total</b>	<b>30</b>	<b>10</b>	<b>20</b>	
3. IES/N0154 Assist in regular maintenance of the bore well drilling equipment	PC1. assist in checking fluid levels, coolant, oils and topping	20	2	1	1
	PC2. check for leakages, tightening and compressor conditions after every drill operation		2.5	1	1.5
	PC3. assist the operator in repairing and maintenance of the equipment		1.5	0.5	1

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	PC4. check the battery level and condition of the terminals as per instructions from the operator		2	0.5	1.5
	PC5. ensure all the tools are kept in the designated place after usage		1.5	0.5	1
	PC6. report defects precisely to the supervisor if beyond scope of his role		1.5	0.5	1
	PC7. use appropriate tools while troubleshooting		1.5	0.5	1
	PC8. assist operator in diagnosing problem and identifying appropriate repair procedures		1.5	0.5	1
	PC9. dispose waste as per the guidelines of the site/ organization		1.5	0.5	1
	PC10. follow reporting procedures as laid down by the employer		1.5	0.5	1
	PC11. assist in completing all documentation in the prescribed standards in a timely manner		1.5	0.5	1
	PC12. report defects precisely to the operator/ supervisor if beyond scope of his role		1.5	0.5	1
	<b>Total</b>		<b>20</b>	<b>7</b>	<b>13</b>
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	<b>15</b>	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		1.5	0.5	1

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	health, safety and environmental guidelines			
	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
	<b>Total</b>	<b>15</b>	<b>5</b>	<b>10</b>
	<b>Grand Total</b>	<b>100</b>	<b>34</b>	<b>66</b>

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### SECTION 2

#### 25. EVIDENCE OF LEVEL

Title/Name of qualification/component: Junior Borewell Drilling Machine Operator		Level: 3	
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
Process	Junior Borewell Drilling Operator is expected to Assist in conducting pre-operation checks on Borewell Drilling Equipment, assist in borewell drilling operations	The activities identified require <b><i>routine and limited range of activities</i></b> for him as these activities are independent of job and worksite he is deployed on. For e.g.: Assist operator in checking fluid levels of engine crank case, radiator coolant and battery electrolyte, etc. Considering the outcomes the job roles is pegged at level 03	3
Professional knowledge	Junior Operator is expected to have <b><i>basic knowledge of the functioning and operation</i></b> of Borewell Drilling equipment. <b><i>Basic Feature/specifications</i></b> of the various attachment used and <b><i>basic knowledge of borewell drilling components, pre-operation checklist and routine maintenance</i></b>	Considering the <b><i>basic professional knowledge</i></b> , which a Junior Borewell Drilling Operator has for assisting the drilling operation and maintenance such as knowledge of engine and motors, types of rods case pipes, this QP is pegged at Level 3.	3
Professional skill	Junior Borewell Drilling Operator <b><i>identifies the appropriate attachment</i></b> for various for various job like choosing the appropriate case pipe, drill rods, attaching the pipes based on instructions from the operator/ supervisor. He	He is <b><i>practically engaged</i></b> in the borewell drilling operation and maintenance. The major skills required are resolving technical issues, comprehension of sign and symbols, etc. Therefore the QP is set at level 3	3

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Title/Name of qualification/component: Junior Borewell Drilling Machine Operator			Level: 3
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
	<i>checks the borewell drilling equipment for operation readiness</i> using pre-operation checklist and <i>conducts the routine maintenance</i> covering lubrication, oil levels, coolant, air filters, motors, tyre, body structure and keep the records as per the operations manual & standard operating procedures.		
Core skill	<p>Junior Operator is expected to follow and respond to the borewell drilling operators' instructions for reading various instrument panel, fluid levels and other indicators for pre-operation checks under and routine maintenance. He has to assist in setting case pipes as per the instructions and job requirement. All of this requires <b>application of basic arithmetic principles</b>.</p> <p>Junior Operator has to continuously give and receive instruction and guidance from operator on-site hence they are expected to be <b>clearly communicate</b></p>	Operator has to continuously give and receive instruction and Jobholder is expected to conduct themselves in ways, which show a basic understanding of the <b>social and professional environment of working at worksites</b> .	3
Responsibility	<p>The jobholder is responsible to:</p> <ul style="list-style-type: none"> <li>Assist in Conduct pre-operation checks</li> </ul>	He has the <b>limited responsibility for own</b> work and majorly <b>function in close supervision of</b>	3

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Title/Name of qualification/component: Junior Borewell Drilling Machine Operator		Level: 3	
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"><li>• Assist in operations of borewell drilling equipment</li><li>• Assist in Conduct routine maintenance</li><li>• Comply with worksite health and safety</li></ul>	Operator which justifies the pegging of the QP at level 3 and not involved in self-learning (which is a requirement for Level 4). In his routine activity he is responsible for his own work (which is a requirement of level 2).	

**SECTION 3**

**EVIDENCE OF NEED**

<b>26</b>	<p><b>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</b></p> <p>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.</p> <p>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.</p> <p>Validations have been received from 32 stakeholders including end- user companies, associations and dealers of the equipment.</p>		
	<b>Basis</b>	<b>In case of SSC</b>	<b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b>
	Need of the qualification	The SSC would undertake market study and would enclosed demand forecast for the proposed job role both on short-term and long-term basis to substantiate the requirement of the Qualification proposed. The SSC can produce the data from primary or authorized secondary sources as well.	The Submitting Body would produce any reputable and reliable research reports, such as labour market information reports; occupational mapping or similar research carried out by Ministry/State/Any other authentic source forecasting the demand for the proposed qualification
	Industry Relevance	The SSC would undertake validation of the job roles with actual end-user industry where such employment are	The Submitting Body would submit the list of industry participation while preparation of the curriculum/ course



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		<p>going to be generated and absorbed instead of generic validation of industry. The SSC would submit the endorsements from users/intended users of the qualification clearly supporting or otherwise the need for trained people against specific job role. <i>(The industry validation format to be used)</i></p>	<p>content of the qualifications. These could include minutes of the meeting/ reports of these consultations</p>
	<p>Usage of the qualification</p>	<p>The SSC would submit details of the employment generated (wherever applicable) and realised by virtue of training in the Qualifications of the sector earlier submitted for NSQF alignment.</p> <p>In case of unorganized sector, case studies or evidences may be given</p>	<p>The submitting body would submit the details of trained and placed data in the proposed qualification (if an existing qualification is being proposed for NSQF alignment)</p> <p>Information about the success of the qualification should be given (eg. uptake figures, examples of use in recruitment and placement rates (if known) should be given. However, many of the bodies that do not have placement tracking mechanism established in place would provide necessary endorsements by the state/ ministry stating that a tracking mechanism would be institutionalized and placement records shall be provided annually or later ,</p>

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			depending on length of qualification.
	Estimated uptake	The SSC would submit the estimated uptake of the qualification and What steps were carried out to test the likely uptake of the qualification? The basis of this estimate should include data about the number of jobs or places in courses of learning which will be available to people who are awarded the qualification.	The Submitting Body should submit the estimated uptake by reflecting the number of the takers for this qualification for at least two years from submission of the qualification
27	<b>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</b> Letter Attached		
28	<b>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</b> <ul style="list-style-type: none"> <li>• NSDC list of Approved and Under-Development QPs was checked prior to commissioning the work</li> <li>• Consultations with Skill Councils for Construction and Mining Sector</li> <li>• NSDC QRC team also confirmed the same</li> </ul>		
29	<b>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? Specify the review process here</b> <ul style="list-style-type: none"> <li>• Employer feedback will be sought post-placement</li> <li>• A formal review is scheduled in three years time</li> </ul>		

Please attach most relevant and recent 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.

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### SECTION 4

#### EVIDENCE OF PROGRESSION

30	<p><b>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?</b> <b><i>Show the career map here to reflect the clear progression</i></b></p> <p>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.</p> <p><b>Junior Borewell Drilling Machine Operator (Level 3) &gt; Borewell Drilling Machine Operator (Level 4) &gt; Senior Borewell Drilling Machine Operator (Level 5) &gt; Master Operator/Trainer Operator (Level 6) &gt; Supervisor (Level 7)</b></p> <p><i>*Level= NSQF level</i></p>
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