

# Model Curriculum

## Sampler

SECTOR: Mining  
SUB-SECTOR: Underground and Open Cast Mines  
OCCUPATION: Ore Processing  
REF ID: MIN/Qo418,V1.0  
NSQF LEVEL: 3



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**SKILL COUNCIL FOR MINING SECTOR**

for the

**MODEL CURRICULUM**

Complying to National Occupational Standards of  
Job Role/Qualification Pack: **'Sampler' QP No. 'MIN/Q0418 NSQF Level 3'**

Date of Issuance: December 24<sup>th</sup>, 2015

Valid up to: March 31<sup>st</sup>, 2017

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

  
Authorized Signatory  
(Skill Council for Mining Sector)

## TABLE OF CONTENTS

1. <a href="#">Curriculum</a>	01
2. <a href="#">Trainer Prerequisites</a>	05
3. <a href="#">Annexure:Assessment Criteria</a>	08

# Sampler

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Sampler”, in the “Mining & Allied” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Sampler		
Qualification Pack Name & Reference ID.	MIN/Q0418		
Version No.	1.0	Version update date	04-06-2017
Pre-requisites to Training	Xth pass with experience of sample collection.		
Training Outcomes	<p><b>After completing this programme, participants will be able to:</b></p> <ul style="list-style-type: none"> <li>• Gain familiarity with the operation:</li> <li>• collect onsite samples, either in open-cast or underground workings of the mine. visits the different sections of the mine on a daily basis to take ore samples. This is a specialized task, since the information obtained from the ore is vital for planning.</li> <li>• Able to perform routine sampling activities using prescribed standard operating procedures involving the taking of basic samples.</li> <li>• Become well versed with Environment Health &amp; Safety: Well versed with on-site health and safety measures relating to sample collection &amp; drilling areas where samples are being collected and use of personal protective equipment.</li> <li>• Identify and use basic tools, equipment &amp; materials: The individual should be able to identify the basics composition of rock / minerals sample.</li> </ul>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Sampler” Qualification Pack issued by “Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Introduction</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 20:00</p> <p><b>Corresponding NOS Code</b> Bridge Module</p>	<p>Sampler will be able to plan and prioritize, quality consciousness, safety orientation, Physique to sustain strenuous conditions, Dexterity. Able to understand the hardness of minerals and different properties as per Mohr’s table – viz. streak, lusture, cleavage etc.</p> <p><u>Introduction on topics:</u></p> <ul style="list-style-type: none"> <li>• Prepare for &amp; obtain representative sample</li> <li>• Testing of sample obtained from the mine and provide the results to the management</li> <li>• Regulatory aspects on Health and Safety</li> </ul> <p>Sampler takes onsite samples, either in open-cast or underground workings of the mine. He visits the different sections of the mine on a daily basis to take ore samples. This is a specialized task, since the information obtained from the ore is vital for planning.</p>	<p>Projector System, Posters, Graph etc.</p>
2	<p><b>Prepare for &amp; obtain representative sample</b></p> <p><b>Theory Duration</b> (hh:mm) 20:00</p> <p><b>Practical Duration</b> (hh:mm) 60:00</p> <p><b>Corresponding NOS Code</b> MIN/N0451</p>	<p>Preparedness for routine sampling activities using prescribed standard operating procedures involving the taking of basic samples. Such samples require limited judgment and involve following standard operating procedures.</p> <ul style="list-style-type: none"> <li>• Prepare for simple sampling</li> <li>• Obtain representative sample</li> <li>• Maintain sample integrity</li> <li>• Check that equipment and materials selected conform to instructions</li> <li>• Take onsite samples, either in open-cast or underground workings of the mine. They visit different sections of the mine on a daily basis to take ore samples. This is a specialized task, since the information obtained from the ore is vital for planning.</li> <li>• Record the conditions under which the sample is taken</li> <li>• Identify and correctly label the sample</li> <li>• Record any deviations from set procedure or anticipated results and take the appropriate action</li> <li>• Clean the sampling equipment and materials to be re-used appropriately</li> <li>• Dispose of other equipment and materials according to standard operating procedures and approved codes of practice</li> <li>• Ensure that the sample taken meets sample plan procedure.</li> <li>• Record all information about the sample accurately using appropriate documentation to permit traceability.</li> <li>• Maintain the condition of the sample according to instructions.</li> <li>• Protect the sample from external sources of contamination.</li> </ul>	<p>Hammer, compass, cutter, Filter, Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.</p>

		<ul style="list-style-type: none"> <li>Control conditions and why it is important to maintain conditions. <ul style="list-style-type: none"> <li>Basic understanding of sampling plan.</li> <li>Interpreting and using a sampling plan.</li> <li>Methods to use for labelling samples.</li> <li>Methods to use for handling, storing and disposing of materials.</li> <li>Knowledge of methods of sampling (spot sampling or strip sampling).</li> </ul> </li> </ul>	
3	<p><b>Testing of sample obtained from the mine and provide the results to the management.</b></p> <p><b>Theory Duration</b> (hh:mm) 20:00</p> <p><b>Practical Duration</b> (hh:mm) 70:00</p> <p><b>Corresponding NOS Code</b> MIN/No452</p>	<p>Testing of sample obtained from the mine and provides the results to the management as per the required specifications and industry standard.</p> <ul style="list-style-type: none"> <li>Follow proper methods of spot sampling to identify the ore concentration at a particular point or strip sampling at regular interval as per the requirement or as directed by sampling in charge</li> <li>Prepare the representative sample by coning and quartering process, or through core cutting in metalliferous mines by working with exploration driller under the guidance of sampling in-charge (supervisor level person)</li> <li>Pack the representative sample packets in sample bags, and tagging to facilitate analysis at laboratories</li> <li>Work in laboratories and determine, by means of chemical processes or other analytical methods, the quantity and quality of elements, both organic and inorganic compounds, and intermediate products in ores. They also process materials and analyze base metals, non-metallic materials, concentrates, effluents and air samples.</li> <li>Use chemical processes such as fire or dry assay procedures and wet chemical methods.</li> <li>Collect and prepare the representative samples using appropriate methods.</li> </ul>	<p>Projector System, Posters, Graph etc. Articulating Truck, Cable/Hammer Tractor. Dragline, Drills, Haul Truck, Loaders, Motor Grader (mining size e.g. CAT 24H), Photo analysis, Quarry tub, Road header, Rock breaker, Mining lamp, Underground Personnel Carriers, Davy lamp, Drill floor, Drilling jumbo, Headboards, Footplates, Cone setting tools, Different size of blade, Wrench, Grease pump/gun, Oil Can, Parking wooden stopper, Hydraulic jack, Filter, Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.</p>
4	<p><b>Health &amp; Safety</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 15:00</p> <p><b>Corresponding NOS Code</b> MIN/No901</p>	<p>This unit provides the information regarding worksite health and safety. This unit is about adhering to health and safety requirements at the worksite during equipment operations.</p> <ul style="list-style-type: none"> <li>Comply with occupational health and safety regulations adopted by the employer.</li> <li>Follow mining operations procedures with respect to materials handling and accidents.</li> <li>Comply with safety, health, security and environment related regulations / guidelines at the work site.</li> <li>Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection.</li> <li>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.</li> <li>Carry out operations as per the manufacturer's and worksite related health and safety guidelines.</li> </ul>	<p>Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.</p>

		<ul style="list-style-type: none"> <li>• Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines.</li> <li>• Follow safety regulations and procedures with regard to worksite hazards and risks.</li> <li>• Operate various grades of fire extinguishers, as applicable.</li> <li>• Support in administering basic first aid and report to concerned team members, as required, in case of an accident.</li> <li>• Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility.</li> <li>• Record and report details related to operations, incidents or accidents, as applicable</li> <li>• Follow the manufacturer’s instructions for care and safe operation of the equipment.</li> <li>• Awareness about benching in quarries, dressing of overhangs, undercuts, fencing.</li> <li>• Uses of First aid and Hygiene.</li> <li>• Awareness of Code of traffic in specific areas of mine. Significance of fences.</li> <li>• Standing orders in force at the mine. Safety in the vicinity of Machinery.</li> <li>• Shot-firing and Safety regulations. How and where to take shelters? Knowledge of mining safety procedures.</li> <li>• Outcome of violation of safety procedures.</li> <li>• Locally prepared Emergency Preparedness / Disaster Management Plan.</li> <li>• Process for reporting any unsafe act/condition in work area which may endanger his or his colleague’s life.</li> <li>• Sources of dust, noise and vibration and measures to minimize.</li> <li>• Hazardous material safety and security rules and regulations as prescribed by DGMS.</li> <li>• In-depth knowledge of operation of the Jack Hammer and chipped materials flow.</li> </ul> <p>Knowledge of technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966.</p>	
	<p><b>Total Duration</b></p> <p><b>Theory Duration</b> 60:00</p> <p><b>Practical Duration</b> 165:00</p>	<p><b>Unique Equipment Required:</b></p> <p>Projector System, Posters, Graph etc. Articulating Truck, Cable/Hammer Tractor. Dragline, Drills, Haul Truck, Loaders, Motor Grader (mining size e.g. CAT 24H), Photo analysis, Quarry tub, Road header, Rock breaker, Mining lamp, Underground Personnel Carriers, Davy lamp, Drill floor, Drilling jumbo, Headboards, Footplates, Cone setting tools. Helmet, gloves, harness, earplugs, goggles, node mask.</p>	

Grand Total Course Duration: 225 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by SSC: Skill Council for Mining Sector)

## Trainer Prerequisites for Job role: "Sampler" mapped to Qualification Pack: "MIN/Qo418"

Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack " <u>MIN/Qo418</u> ".
2	<b>Personal Attributes</b>	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	<b>Minimum Educational Qualifications</b>	Class XII Pass
4a	<b>Domain Certification</b>	Statutory Certificate from Directorate General of Mines Safety (DGMS) for Job Role: " <u>Sampler</u> " mapped to QP: " <u>MIN/Qo418</u> ". Minimum accepted score for domain certification will be 80%.
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Qo102". Minimum accepted score for platform certification will be 80%.
5	<b>Experience</b>	Preferably 2-3 years of experience of relevant field / minerals handling or in sample collection / analysis.



## Annexure: Assessment Criteria

<b>Assessment Criteria for Sampler</b>	
<b>Job Role</b>	<b>Sampler</b>
<b>Qualification Pack</b>	<b>MIN/Qo418</b>
<b>Sector Skill Council</b>	<b>Mining</b>

Sr. No.	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 of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behavior and attitude will be assessed while performing the task.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training Centre (as per assessment criteria given)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training Centre based on these criteria.
5	To pass the Qualification Pack, every trainee should score a minimum of 50% in every NOS
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 Outcome	Assessment criteria	Total Mark (100)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. MIN/ N0451 (Prepare for & obtain representative sample)	PC1. Ensure that the conditions for sampling are in accordance with laid down procedures	35	3	1	2
	PC2. Check that equipment and materials selected conform to instructions.				
	PC3. Check that the equipment is in calibration.				
	PC4. Ensure that the required resources are available and appropriate.				
	PC5. Take onsite samples, either in open-cast or underground workings of the mine. They visit different sections of the mine on a daily basis to take ore samples. This is a specialized task, since the information obtained from the ore is vital for planning.				
	PC6. Record the conditions under which the sample is taken.				
	PC7. Identify and correctly label the sample				
	PC8. Record any deviations from set procedure or anticipated results and take the appropriate action				
	PC9. Clean the sampling equipment and materials to be re-used appropriately				

### Sampler

	PC10. Dispose of other equipment and materials according to standard operating procedures and approved codes of practice		3	1	2
	PC11. Ensure that the sample taken meets sample plan procedure.		2	1	1
	PC12. Record all information about the sample accurately. using appropriate documentation to permit traceability.		3	0	3
	PC13. Maintain the condition of the sample according to instructions.		2	1	1
	PC14. Protect the sample from external sources of contamination.		2	1	1
	PC15. Take the appropriate action in the event of abnormal occurrences affecting sample condition.		2	1	1
		<b>Total</b>	<b>35</b>	<b>12</b>	<b>23</b>
2. MIN/ N0452 (Testing of sample obtained from the mine and provide the results to the management)	PC1. Follow proper methods of spot sampling to identify the ore concentration at a particular point or strip sampling at regular interval as per the requirement or as directed by sampling in charge	<b>35</b>	6	3	3
	PC2. Prepare the representative sample by coning and quartering process, or through core cutting in metalliferous mines by working with exploration driller under the guidance of sampling in-charge (supervisor level person).		6	3	3
	PC3. Pack the representative sample packets in sample bags, and tagging to facilitate analysis at laboratories.		6	3	3
	PC4. Work in laboratories and determine, by means of chemical processes or other analytical methods, the quantity and quality of elements, both organic and inorganic compounds, and intermediate products in ores. They also process materials and analyze base metals, non-metallic materials, concentrates, effluents and air samples.		6	3	3
	PC5. Use chemical processes such as fire or dry assay procedures and wet chemical methods.		6	3	3
	PC6. Collect and prepare the representative samples using appropriate methods.		5	3	2
		<b>Total</b>	<b>35</b>	<b>18</b>	<b>17</b>
3. MIN/N0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	<b>30</b>	3	1	2
	PC2. Follow mining operations procedures with respect to materials handling and accidents.		3	1	2
	PC3. Follow the correct safety steps in case of accident or major failure.		2	0	2

	PC4. Comply with safety regulations and procedures in case of fire hazard.		2	1	1
	PC5. Operate various grades of fire extinguishers.		3	0	3
	PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public.		3	1	2
	PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		3	1	2
	PC8. Deal with misfires as per statutory requirement		3	1	2
	PC9. Identify characteristics of post-blast fumes and take necessary precautions.		3	1	2
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection		3	1	2
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		2	1	1
	<b>NOS Total</b>	<b>Total</b>	<b>30</b>	<b>9</b>	<b>21</b>
	<b>QP Total</b>		<b>100</b>	<b>39</b>	<b>61</b>
	<b>Percentage Weightage:</b>			<b>39%</b>	<b>61%</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>50%</b>	