



Model Curriculum

Refractory Brick Layer

SECTOR: IRON & STEEL
SUB-SECTOR: STEEL

OCCUPATION: Refractory Maintenance
REF ID: ISC/Q1201
NSQF LEVEL: 3



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

INDIAN IRON AND STEEL SECTOR SKILL COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: Refractory Brick Layer OP No. ISC/Q1201 NSQF Level 3

Date of Issuance: December 22nd, 2015

Valid up to: December 21st, 2016

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


Authorised Signatory
(Indian Iron and Steel Sector Skill Council)



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REFRACTORY BRICK LAYER

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Refractory Brick Layer”, in the “Iron & Steel” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Refractory Brick Layer		
Qualification Pack Name & Reference ID.	Refractory Brick Layer ISC/Q1201		
Version No.	1.0	Version Update Date	25-03-2015
Pre-requisites to Training	Minimum qualification – Class 10th Pass		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Understand the brick laying job • Arrange necessary tools, tackles and material for brick laying job • Lay refractory bricks according to design • Use basic health and safety practices at workplace • Work effectively with others 		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Refractory Brick Layer” Qualification Pack issued by “Indian Iron & Steel Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Over view of Iron & Steel Industry Theory Duration (hh:mm) 04:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code	<ul style="list-style-type: none"> • Understanding Iron & steel industry • Understanding types of Iron & Steel Industry • Understanding products of Iron & Steel industry • Activities in Iron & Steel Industry 	PPTs of Iron and steel manufacturing, Charts showing the same
2	Occupational, Health and Safety (OHAS) Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm)	<ul style="list-style-type: none"> • Understanding the Occupational health & Safety • Understand What is hazard • Documentation for Health and safety • Working at Heights, confined spaces • Remedies for fire at work place 	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	15:00 Corresponding NOS Code ISC/N0008		
3	5S & House keeping Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm) 15:00 Corresponding NOS Code ISC/N0004	<ul style="list-style-type: none"> • Identification of bottlenecks in functioning of work place • Various methods of housekeeping both pre-work & post-work as well 	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S
4	Understand the brick laying job Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ISC/N1201	<ul style="list-style-type: none"> • Understand the brick-laying job from the supervisor • Study the drawing and specifications of the job at the site of the particular installation where bricking needs to be done 	PPTs for various types of drawings, Blue prints, bricks, tiles, mortar Hand tools and lifting machines, various measuring instruments
5	Arrange necessary tools, tackles and material for brick laying job Duration (hh:mm) 20:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ISC/N1202	<ul style="list-style-type: none"> • Arrange tools, tackles and raw materials required for the brick laying job • Prepare the mortar or/and the bonding material in the correct proportion following the SOP 	Bricks, tiles, mortar Hand tools and lifting machines, various measuring instruments
6	Lay refractory bricks according to design Theory Duration (hh:mm) 38:00	<ul style="list-style-type: none"> • Study the drawing and specifications of the job & study the area of the particular installation where bricking needs to be done • Prepare the surface where bricking 	PPTs for various types of bearings/drawings, Blue prints, & samples for bearings and

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Practical Duration (hh:mm) 100:00 Corresponding NOS Code ISC/N0206	<p>is to be done</p> <ul style="list-style-type: none"> Break or cut new bricks, tiles, or blocks to size where needed to suit the specific application Lay the bricks with the setting mixture following the SOP on installations like cupola, kilns, ovens, or furnaces 	<p>respective machines Hand tools and lifting machines, pullers, various measuring instruments</p>
7	Use basic health and safety practices at the workplace Duration (hh:mm) 12:00 Practical Duration (hh:mm) 15:00 Corresponding NOS Code ISC/N0008	<ul style="list-style-type: none"> Health and safety procedures Fire safety procedures Emergencies, rescue and first aid procedures 	<p>PPE, Different Type of Safety Sign, First Aid Box, Safety instrument and clothing, Step Ladder, Sample Accident reports ,Fire Extinguishers, Items required for fire extinguisher and fire Safety</p>
8	Work effectively with others Duration (hh:mm) 12:00 Practical Duration (hh:mm) 15:00 Corresponding NOS Code ISC/N0009	<ul style="list-style-type: none"> Ensure appropriate communication with superiors, peers and others as applicable at work place Demonstrate appropriate behaviour and etiquette at work place 	<p>Communication skills PPTs, Posters Team management posters</p>
	Total Duration Theory Duration 86:00 Practical Duration 224:00	Unique Equipment Required: <ul style="list-style-type: none"> Mechanical Drawings, Blueprints, Basic Tools and Equipment's, measuring tools& precision measurement tools, Assembling tools Lubricant and coolant Material and Equipment for cleaning, Bearing pulling, lifting machines PPE, Safety Sign, First Aid Box, Fire Extinguishers 	

Grand Total Course Duration: **300Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by Indian Iron and Steel Sector Skills Council)



Trainer Prerequisites for Job role: “Refractory Brick Layer” mapped to Qualification Pack: “ISC/Q1201”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q1201”.
2	Personal Attributes	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	Minimum Educational Qualifications	Min. ITI Fitter pass and preferably CTI/ATI cleared/ Diploma Mechanical
4a	Domain Certification	Certified for Job Role: “Refractory Brick Layer” mapped to QP: “ISC/Q1201”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/1402”. Minimum accepted score is 80%
5	Experience	Min. 5 years industry experience and minimum 2 years’ experience as Trained or un trained for same Job Role/ Trade



Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Refractory Brick Layer
Qualification Pack	ISC/Q1201
Sector Skill Council	Indian Iron & Steel Sector Skill Council

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 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 centre (as per assessment criteria below)
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 60% 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.

Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
ISC/N1201: Understand the brick laying job	PC1. Understand the brick laying job at actual work site from the supervisor	100	19	10	9
	PC2. Study the area where the bricking is to be performed		9	0	9
	PC3. Study the drawing/sketch/specifications of the job		21	20	1
	PC4. Plan the requirements of tools, tackles & materials e.g. brick cutting machine, tape, power saw, hammer, spirit level, measuring tape, trowels, hand tools, jointing tools, wire-clamps, sledge hammer, chipping gun, chisel etc.		51	50	1
	NOS Total Marks	Total	100	80	20



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
ISC/N1202: Arrange necessary tools, tackles and material for brick laying job	PC1. List out tools, tackles and raw materials required for the brick laying job	200	11	10	1
	PC2. Arrange the tools, tackles and raw materials from the store / department		19	0	19
	PC3. Understand how to use tools & tackles like brick cutting machine, tape, power saw, hammer, spirit level, measuring tape, trowels , hand tools, jointing tools, wireclamps, sledge hammer, , chipping gun, chisel etc.		100	20	80
	PC4. Quantify volume, sizes and numbers of the required raw materials e.g. different bricks, mortar powder, sand, clay etc.		31	30	1
	PC5. How to mix specified amounts of sand/ clay/ mortar powder with water in correct proportion to form refractory mixtures, or mortar for bonding		39	0	39
	NOS Total Marks	Total	200	60	140
ISC/N1203: Lay refractory bricks according to design	PC1. Read the drawing(s)& specifications for the brick-laying job & follow the instructions in SOP	450	21	20	1
	PC2. Understand the bricking requirements of a straight wall, corner wall , arch etc.		31	30	1



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC3. Remove burned or damaged brick or mortar, using sledgehammer, crowbar, chipping gun, or chisel		19	0	19
	PC4. Clean working surface to remove scale, dust, soot, or chips of brick and mortar, using broom, wire brush, or scraper		39	0	39
	PC5. Break or cut new bricks, tiles, or blocks to size where needed to suit the specific application, using brick cutting m/c, trowel edge, hammer, or power saw.		70	0	70
	PC6. Lay the bricks with the setting mixture following the SOP on the designated areas requiring repair or replacement or new construction		200	20	180
	PC7. Remove excess mortar with trowels and hand tools, and finish mortar joints with jointing tools, for a sealed, uniform appearance		20	0	20
	PC8. Ensure precautions for proper drying of the newly done surface		10	0	10
	PC9. Follow safety precautions especially while handling heavy precast blocks/slippy & smooth carbonaceous bricks		40	10	30
	NOS Total Marks	Total	450	80	370
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	10	5	5



Assessment outcome (nos)	Assessment criteria	Total marks	Marks allocation		
			Out of	Theory	Skills practical
	PC2. State the name and location of people responsible for health and safety in the workplace		5	0	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		1	0	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		9	5	4
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		10	5	5
	PC6. State location of general health and safety equipment in the workplace		5	0	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		5	0	5
	PC8. Work safely in and around trenches, elevated places and confined areas		5	0	5
	PC9. Lift heavy objects safely using correct procedures		5	0	5
	PC10. Apply good housekeeping practices at all times		1	0	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		4	0	4



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	5	4
	PC14. Demonstrate rescue techniques applied during fire hazard		10	5	5
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		1	0	1
	PC16. Demonstrate the correct use of a fire extinguisher		4	0	4
	PC17. Demonstrate how to free a person from electrocution		5	0	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		10	5	5
	PC19. Demonstrate basic techniques of bandaging		5	0	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		10	5	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		5	0	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency		5	0	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	services in real or simulated cases				
	PC23. Demonstrate the artificial respiration and the CPR Process		5	0	5
	PC24. Participate in emergency procedures		5	0	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		9	5	4
	PC26. Demonstrate correct method to move injured people and others during an emergency		1	0	1
	NOS Total Marks	Total	150	45	105
ISC/N0009: Work effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
	PC4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	5	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5
	PC6. Display appropriate communication etiquette while working		10	0	10
	PC7. Display active listening skills while interacting with others at work		10	0	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
	PC9. Demonstrate responsible and disciplined behaviors at the workplace		15	5	10
	PC10. Escalate grievances and problems to		5	0	5
	NOS Total Marks	Total	100	30	70
	Grand Total	900	900	265	635
	Percentage Weightage:			50%	50%
	Minimum Pass% to qualify (aggregate):			60%	