



Model Curriculum

QP Name: Grinder - Construction

QP Code: CON/Q1203

Version: 3.0

NSQF Level: 3

Model Curriculum Version: 3.0

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Training Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Fabrication
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7224.0100
Minimum Educational Qualification and Experience	Grade 10 Pass OR Grade 8 pass with 2-year of (NTC/ NAC) after 8th OR 9th grade pass with 1-year relevant experience OR 8th grade pass with 2-year relevant experience OR 5th grade pass with 5-year relevant experience OR Previous relevant Qualification of NSQF Level 2 with 3-year relevant experience OR Previous relevant qualification of NSQF Level 2.5 with 1.5 relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	31/08/2023
Next Review Date	31/08/2026
NSQC Approval Date	31/08/2023
QP Version	3.0
Model Curriculum Creation Date	31/08/2023
Model Curriculum Valid Up to Date	31/08/2026



Model Curriculum Version	3.0
Minimum Duration of the Course	300 Hours
Maximum Duration of the Course	300 Hours

Program Overview

This section summarises the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Explain the process of assisting in marking and fit-up of structural steel elements.
- Describe the process of carrying out grinding activities on structural steel elements.
- Explain the importance of working effectively in a team to deliver desired results at the workplace.
- Elucidate ways to work according to personal health, safety and environment protocols at construction site.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
CON/N1203: Assist in marking and fit-up of structural steel elements NOS Version- 4.0 NSQF Level- 3	40:00	50:00	30:00	00:00	120:00
Module 1: Introduction to the role of a Grinder - Construction	05:00	00:00	00:00	00:00	05:00
Module 2: Process of assisting in marking and fit-up of structural steel elements	35:00	50:00	30:00	00:00	115:00
CON/N1206: Carry out grinding activities on structural steel elements NOS Version- 3.0 NSQF Level- 3	40:00	50:00	00:00	00:00	90:00
Module 3: Process of carrying out grinding activities on structural steel elements	40:00	50:00	00:00	00:00	90:00
CON/N8001: Work effectively in a team to deliver desired results at the workplace	05:00	25:00	00:00	00:00	30:00



NOS Version- 12.0 NSQF Level- 4					
Module 4: Work effectively in a team to deliver desired results at the workplace	05:00	25:00	00:00	00:00	30:00
CON/N9001: Work according to personal health, safety and environment protocols at construction site NOS Version- 10.0 NSQF Level- 4	05:00	25:00	00:00	00:00	30:00
Module 5: Follow safety norms as defined by organization, adopt healthy and safe work practices	05:00	25:00	00:00	00:00	30:00
DGT/VSQ/N0101: Employability Skills NOS Version- 1.0 NSQF Level- 2	30:00	00:00	00:00	00:00	30:00
Module 6: Employability Skills	30:00	00:00	00:00	00:00	30:00
Total Duration	120:00	150:00	30:00	00:00	300:00



Module Details

Module 1: Introduction to the role of a Grinder - Construction

Mapped to CON/N1203 v4.0

Terminal Outcomes:

- Discuss the job role of a Grinder - Construction.

Duration: 05:00	Duration: 0:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the Construction industry and its sub-sectors. • Discuss the role and responsibilities of a Grinder - Construction. • Identify various employment opportunities for a Grinder - Construction. 	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	



Module 2: Process of assisting in marking and fit-up of structural steel elements

Mapped to CON/N1203 v4.0

Terminal Outcomes:

- Elucidate ways to measure and mark structural steel elements.

Duration: 35:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the use of relevant marking and measurement tools and methods of measuring and marking. • Discuss the applicable housekeeping practices to be followed to keep the work area clean. • Explain different types of sections, plates, etc. • Explain how to interpret relevant hand sketches/ drawings • Explain how to handle heavy materials safely. • Explain how to mitigate the safety hazards while working with heavy materials, e.g. use of appropriate Personal Protective Equipment (PPE). • Explain the use of relevant tools and equipment for the grinding operations. • Elucidate different types of surface finish achievable by using different grinding tools. • Explain the importance and use of relevant PPE. • State the identification of different materials based on their shape, size and thickness 	<ul style="list-style-type: none"> • Demonstrate how to conduct linear measurements, such as length, width, diameter, using measuring tools, such as tapers, rulers, calipers, etc. • Show how to place the sections, plates, pipes or tubes in the appropriate position as per the given instructions. • Show how to mark the position of bolts, plates or sections for fit-up as per the given instructions. • Demonstrate ways to identify and report any undulations or bends during measurements to the supervisor for appropriate corrective measures to be taken
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Portable Hand Angle Grinder, Chalk Marker, Measuring Tape, Hammer, Tweezers, Safety Helmet, Safety Gloves, Nose Mask, Ear Muff, Safety Goggles, Safety Harness, Safety Shoes, Jump Suit, Fire Extinguisher, Sand Bucket, Safety Message Board, Operator - Leather Apron, Reflective Jacket, Safety Belt, Tools Bag	



Module 3: Process of carrying out grinding activities on structural steel elements

Mapped to CON/N1206 v3.0

Terminal Outcomes:

- Explain the process of preparing for grinding.
- Describe the process of carrying out grinding.

Duration: 40:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Discuss the standard practices of construction fabrication. ● Explain the safety regulations concerning the use of grinding machine. ● Describe the process of measuring structural steel material for measurement and marking fit-up positions. ● Explain the importance of personal protection and use of relevant safety gear and equipment. ● Explain the importance of housekeeping. ● Discuss the applicable housekeeping practices. ● Explain the application and specifications of different types of grinding machines. ● Explain different parts of the grinding machine. ● Explain the use of different hand and power tools for fabrication. ● Explain use of different tools and tackles as per the work requirement. ● State the tolerance limits and range of operation for common hand and power tools. ● Discuss the ergonomic principles applicable to carrying loads. ● Explain the use of tools and tackles in rigging. ● Discuss the standard practices regarding heavy material lifting and 	<ul style="list-style-type: none"> ● Show how to check the grinder is in working condition by conducting the necessary tests as instructed by the supervisor. ● Demonstrate the process of operating the grinding machine in the appropriate patterns as per the work requirements. ● Demonstrate the process of applying appropriate pressure at the correct angle as per work requirement to minimize the wastage of consumables. ● Show how to grind excessive root reinforcements in welded joints, and defective weld joints to the required depth. ● Demonstrate the process of carrying out basic maintenance of different hand and power tools.

<p>shifting.</p> <ul style="list-style-type: none"> ● State the specifications and use of different types of grinding consumables. ● Explain how to optimize the use of grinding consumables. ● Explain the importance of cleaning the surface before grinding. ● Explain various operations of the grinding machine. ● State the specification of grinding wheels. ● Explain the importance of maintaining an appropriate body posture during grinding. ● State various patterns of grinding. ● Explain the importance of angle of grinding. ● State the appropriate pressure to be applied during grinding and its relation to minimizing wastage. ● Explain how to finish welded connections. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Portable Hand Angle Grinder, Chalk Marker, Measuring Tape, Hammer, Tweezers, Safety Helmet, Safety Gloves, Nose Mask, Ear Muff, Safety Goggles, Safety Harness, Safety Shoes, Jump Suit, Fire Extinguisher, Sand Bucket, Safety Message Board, Operator - Leather Apron, Reflective Jacket, Safety Belt, Tools Bag</p>	



Module 4: Work effectively in a team to deliver desired results at the workplace

Mapped to CON/N8001 v12.0

Terminal Outcomes:

- Explain the importance of interacting and communicating in an effective manner.
- Elucidate ways to support co-workers to execute the project requirements.
- Elucidate ways to practice inclusion at workplace.

Duration: 05:00	Duration: 25:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Elucidate own roles and responsibilities. ● Explain the importance of effective communication. ● Elucidate the consequence of poor teamwork on project outcomes, timelines, safety at the construction site, etc. ● Explain different modes of communication used at workplace. ● Explain the importance of creating healthy and cooperative work environment among the gangs of workers. ● Elucidate applicable techniques of work, properties of materials used, tools and tackles used, safety standards that co-workers might need as per the requirement. ● Explain the importance of proper and effective communication and the expected adverse effects in case of failure relating to quality, timeliness, safety, risks at the construction project site. ● Explain the importance and need of supporting co-workers facing problems for the smooth functioning of work. ● Discuss the fundamental concept of gender equality. ● Explain how to recognise and be sensitive to issues of disability, culture and gender. 	<ul style="list-style-type: none"> ● Demonstrate how to pass on work related information/ requirement clearly to the team members. ● Show how to report any unresolved problem to the supervisor immediately. ● Demonstrate ways to hand over the required material, tools, tackles, equipment and work fronts timely to interfacing teams. ● Demonstrate ways to work together with co-workers in a synchronized manner. ● Demonstrate effective implementation of gender neutral practices at workplace. ● Demonstrate ways to address discriminatory and offensive behaviour in a professional manner as per organizational policy.



- Discuss legislation, policies, and procedures relating to gender sensitivity and cultural diversity including their impact on the area of operation.

Classroom Aids

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films

Tools, Equipment and Other Requirements

NA

Module 5: Work according to personal health, safety and environment protocols at construction site

Mapped to NOS CON/N9001 v10.0

Terminal Outcomes:

- Explain the importance of following safety norms as defined by organization.
- Explain the need to adopt healthy & safe work practices.
- Describe the process of implementing good housekeeping and environment protection process and activities.
- Explain the importance of following infection control guidelines as per applicability.

Duration: 05:00	Duration: 25:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Describe the reporting procedures in cases of breaches or hazards for site safety, accidents, and emergency situations as per guidelines. ● Explain different types of safety hazards at construction sites. ● Discuss basic ergonomic principles as per applicability. ● Describe the procedure for responding to accidents and other emergencies at site. ● Explain the importance of handling tools, equipment, and materials as per applicable norms. ● Explain the effect of construction material on health and environments as per applicability. ● Describe various environmental protection methods as per applicability. ● Explain the storage requirement of waste including non-combustible scrap material and debris, combustible scrap material and debris, general construction waste and trash (non-toxic, non-hazardous), any other hazardous wastes and any other flammable wastes at the appropriate location. ● Explain how to use hazardous material in a safe and appropriate manner as per applicability. 	<ul style="list-style-type: none"> ● Demonstrate how to follow emergency and evacuation procedures in case of accidents, fires, or natural calamities. ● Show how to operate different types of fire extinguishers corresponding to various types of fires as per EHS guidelines. ● Demonstrate the use of appropriate Personal Protective Equipment (PPE) as per work requirements for Head Protection, Ear Protection, Fall Protection, Foot Protection, Face and Eye Protection, Hand and Body Protection, and Respiratory Protection (if required). ● Demonstrate how to check and install all safety equipment as per standard guidelines. ● Show how to collect, segregate and deposit construction waste into appropriate containers based on their toxicity or hazardous nature. ● Show how to clean and disinfect all materials, tools and supplies before and after use.

<ul style="list-style-type: none"> ● Explain types of fire. ● Describe the procedure of operating different types of fire extinguishers. ● State safety relevant to tools, tackles, and equipment as per applicability. ● List housekeeping activities relevant to task. ● Elucidate ways of transmission of infection ● Elucidate ways to manage infectious risks at the workplace. ● Describe different methods of cleaning, disinfection, sterilization, and sanitization. ● List the symptoms of infection like fever, cough, redness, swelling, and inflammation. 	
Classroom Aids:	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
Tools, Equipment and Other Requirements	
Leather Hand Gloves, Jump suit, Wire brush, Hand and Leg guard leather, Safety goggles, Nose mask, Ear protection, Fire extinguishers, Sand buckets Flashback arrestors, Welding helmet, Welding glass, Fire Extinguisher, Fire prevention kit, First Aid box, Safety tags, Safety Notice board	



Module 6: Employability Skills

Mapped to NOS DGT/VSQ/N0101 v1.0

Duration: 30:00

Key Learning Outcomes

Introduction to Employability Skills Duration: 1 Hour

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

Constitutional values - Citizenship Duration: 1 Hour

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.

3. Show how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century Duration: 1 Hours

4. Discuss 21st century skills.

5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

Basic English Skills Duration: 2 Hours

6. Use appropriate basic English sentences/phrases while speaking

Communication Skills Duration: 4 Hour

7. Demonstrate how to communicate in a well -mannered way with others.

8. Demonstrate working with others in a team

Diversity & Inclusion Duration: 1 Hour

9. Show how to conduct oneself appropriately with all genders and PwD

10. Discuss the significance of reporting sexual harassment issues in time

Financial and Legal Literacy Duration: 4 Hours

11. Discuss the significance of using financial products and services safely and securely.

12. Explain the importance of managing expenses, income, and savings.

13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

Essential Digital Skills Duration: 3 Hours

14. Show how to operate digital devices and use the associated applications and features, safely and securely

15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

Entrepreneurship Duration: 7 Hours

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

Customer Service Duration: 4 Hours

17. Differentiate between types of customers

18. Explain the significance of identifying customer needs and addressing them

19. Discuss the significance of maintaining hygiene and dressing appropriately

Getting ready for apprenticeship & Jobs Duration: 2 Hours

20. Create a biodata

21. Use various sources to search and apply for jobs

22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview

23. Discuss how to search and register for apprenticeship opportunities



Module 7: On-the-Job Training

Mapped to Grinder - Construction

Mandatory Duration: 30:00	Recommended Duration: 00:00
Location: On-Site	
Terminal Outcomes	
<ul style="list-style-type: none">● Explain the use of relevant marking and measurement tools and methods of measuring and marking.● Conduct linear measurements, such as length, width, diameter, using measuring tools, such as tapers, rulers, calipers, etc.● Mark the position of bolts, plates or sections for fit-up as per the given instructions.● Operate the grinding machine in the appropriate patterns as per the work requirements.● Grind excessive root reinforcements in welded joints, and defective weld joints to the required depth.● Carry out basic maintenance of different hand and power tools.● Operate different types of fire extinguishers corresponding to various types of fires as per EHS guideline.	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialisation	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
B. Tech	Civil/Mechanical/ Electrical	1	Fabrication	0	-	
Diploma	Civil/Mechanical/ Electrical	2	Fabrication	0	-	
ITI	Civil/Mechanical/ Electrical	4	Fabrication	0	-	
General BA/BSc./ EX-Army/ 12th	Civil/Mechanical/ Electrical	4	Fabrication	0	-	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role “Grinder - Construction”, mapped to QP: “CON/Q1203, v3.0”, Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, v2.0”. The minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B. Tech	Civil/Mechanical/ Electrical	2	Fabrication	0	-	
Diploma	Civil/Mechanical/ Electrical	4	Fabrication	0	-	
ITI	Civil/Mechanical/ Electrical	5	Fabrication	0	-	

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role “Grinder - Construction”, mapped to QP: “CON/Q1203 v3.0”, Minimum accepted score is 80%	Recommended that the Assessor is certified for the Job Role: “Assessor (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0”, with a minimum score of 80%.



Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SIP
- The batch allocation Matrix prepared for each month based on previous months' performance of AAs, which determines the quantum of Assessment which can be allocated to each AA for a month
- Post allocation of assessment, Assessment agencies send the assessment confirmation to SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process.

2. Testing Environment:

- A combination of Theory and practical/demonstration test is deployed to assess knowledge and Skill respectively of Learners.
- Assessment is conducted at Training center in in-person/offline mode
- For Skill assessment, environment is simulated to create a realistic Working Environment that should replicate the key features of the workplace. In job roles, where it is difficult to replicate the same, the OJT assessment is implemented.
- During the practical task, trainees are assessed on their workmanship, quality of finished product, time management, etc., based on the performance criteria (PC), knowledge and understanding and their professional and soft skills as specified in the qualification pack.
- Knowledge assessment is done through closed ended questions up to level 4 and from level 5 onwards, it is mixture of open ended and closed ended questions

3. Assessment Quality Assurance levels/Framework

- Assessment criteria is developed for each QP which acts as a guide for developing question set /banks
- Sample questions aligned with Assessment criteria for each QP are developed by SSC and validated by industry
- Taking reference of Assessment criteria and Sample Questions, AAs create the question bank which is further validated by SSC
- Questions are mapped to the specified assessment criteria
- It is mandatory that Assessor and Trainer must be ToA certified & ToT Certified respectively
- Continuous Monitoring through virtual and In-person mode are conducted to ensure the assessment is conducted as per stipulated process
- Process and Technical audit of assessment batches by quality team are conducted to avoid the errors in assessment process



- A well -defined comprehensive framework of NON-COMPLIANCE MATRIX is defined and implemented to identify the non-compliance made by assessor and AA and punitive actions are taken correspondingly.
- The capacity building sessions are conducted regularly for assessors and assessment agencies to update them about best practices in assessment

4. Types of evidence or evidence-gathering protocol:

- Post Assessment, the evidences are uploaded by Assessor to assessment agency and further assessment agency to SSC as per stipulated TAT
- Evidences are broadly the photographic and video graphic in nature
- Assessment agencies upload the evidence on SIP and detailed evidence on SSC digital platform (ZoHO)
- Evidences are; NOS wise-Geotagged photographs and videos of Theory Test & Practical Tasks, Attendance sheet, result summary sheet, group photographs.

5. Method of verification or validation:

- The process and technical audit of assessment batches are done by SSC
- Attendance of each candidate is verified and it is ensured that only those candidates are assessed by assessors who are meeting the stipulated minimum percentage of attendance
- The result of each candidate is verified, it is verified that that result on SIP are matching with respect to summary sheet submitted by AAs
- Under detailed technical audit for sample of batches, the knowledge and skill assessment results for each candidate is checked in technical aspect.
- All the evidences of batches are preserved on server of SSC digital platform

On the Job:

- On job training (OJT), candidates undergo training and leaning at actual workplace for a fixed period of time and a certain weightage of assessment is allocated out of total skill weightage of Qualification Pack for undergoing OJT as stipulated by CSDCI. This OJT score and assessors' end point score are combined to arrive at final Marking/grading of trainees' skill test. The OJT score is determined by Supervisor of company under which candidates undergo on job training.



References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do it upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.



Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
CSDCI	Construction Skill development Council of India
MCQ	Multiple Choice Question
EHS	Environment Health and Safety
IPS	Indian Patent Stone
VDF	Vacuum Dewatering Flooring