Model Curriculum

QP Name: Construction Fitter

QP Code: CON/Q1205

Version: 3.0

NSQF Level: 3.5

Model Curriculum Version: 3.0

Construction Skill Development Council of India|| Tower 4B, DLF Corporate Park, 201&, 202 4B, Mehrauli-Gurgaon Rd, DLF Phase 3, Gurugram, Haryana 122002

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Training Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Fabrication
Country	India
NSQF Level	3.5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7214.0800
Minimum Educational Qualification and Experience	11th Grade pass OR Completed 1st year of 3-year diploma after 10th OR 10th grade pass and pursuing continuous schooling OR 8th Grade pass with 3-year relevant experience OR Previous relevant Qualification of NSQF Level 2.5 with 3-year relevant experience OR Previous relevant Qualification of NSQF Level 3 with 1.5-year 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	360 Hours
Maximum Duration of the Course	360 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:

- Describe the process of carrying out marking on structural steel elements for fit-up.
- Describe the process of performing the fit-up of assemblies.
- 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/N1208: Carry out marking on structural steel elements for fit-up **NOS Version- 3.0** **NSQF Level- 3.5**	**40:00**	**80:00**	**30:00**	**00:00**	**150:00**
Module 1: Introduction to the role of a Construction Fitter	05:00	00:00	00:00	00:00	05:00
Module 2: Process of carrying out marking on structural steel elements for fit-up	35:00	80:00	30:00	00:00	145:00
CON/N1209: Perform the fit-up of assemblies **NOS Version- 3.0** **NSQF Level- 3.5**	**40:00**	**50:00**	**30:00**	**00:00**	**120:00**
Module 3: Process of performing the fit-up of assemblies	40:00	50:00	30:00	00:00	120:00
CON/N8001: Work effectively in a team to deliver desired results at the workplace **NOS Version- 12.0** **NSQF Level- 4**	**05:00**	**25:00**	**00:00**	**00:00**	**30:00**

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**	**180:00**	**60:00**	**00:00**	**360:00**

Module Details

Module 1: Introduction to the role of a Construction Fitter

Mapped to CON/N1208 v3.0

Terminal Outcomes:

- Discuss the job role of a Construction Fitter.

Duration: 05:00	**Duration: 0:00**
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Describe the size and scope of the Construction industry and its sub-sectors. • Discuss the role and responsibilities of a Construction Fitter. • Identify various employment opportunities for a Construction Fitter.	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Process of carrying out marking on structural steel elements for fit-up

Mapped to CON/N1208 v3.0

Terminal Outcomes:

- Describe the process of computing the dimensions of assemblies or components.
- Elucidate ways to select the correct workpieces.
- Describe the process of making markings on workpieces.

Duration: 35:00	Duration: 80:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List different symbols on the drawing sheet and their correct interpretations. • Explain how to identify material based on shape, dimension and grade. • Explain the basics of arithmetic and geometry. • Describe the other procedures involved in fabrication, such as gas cutting, use of heating torch, grinding, etc. • Explain different types of portable and installed grinders, and their applications. • Explain different types of blades available in the market. • Describe the process of drilling and various equipment used in grinding work. • Describe different methods of cutting a metal section, such as shearing. • Describe the process of installing bolts. • Explain the importance of washers and torque requirements. • Describe the procedure of installing rivets and different equipment used in the process. • Explain the correct method to be followed to straighten or bend different types of sections or plates. • Elucidate the selection criteria for	• Demonstrate how to use linear calculations to calculate the necessary section dimensions and note the orientation of sections. • Show how to clean the section's surface thoroughly to remove any debris, paint, oil, rust, etc. • Demonstrate the use of the appropriate measuring and marking tools and instruments, measuring tape, scribers, etc. • Show how to mark external surfaces of sections with precise marks that are easy to recognize.

different marking instruments based on the surface and other requirements. ● Explain the use of different measuring instruments and tools based on the work requirements. ● Describe the correct procedure for measuring and marking the sections.	

Classroom Aids

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

Tools, Equipment and Other Requirements

Drilling Machine with Bits, Electric Screw Gun, Electric Hex Saw, Welding Tools and Accessories, Gas Cutting Tools and Accessories, Grinding Tools and Accessories, Pliers, Files, Temperature Gun/Chalk, Clamps and Anchors, Vices, Forklift, Slings, Wire Ropes, Shackles, Spreader Board, Chain, Link, Eye Hook, Eye Bolts, Bull Dog Grips, Clamp, Socket, Metric Tape, Line Dori, Scale, Welding Gauge, Hammer, Punch, Safety Helmet, Safety Goggles, Safety Shoes, Safety Belt, Ear Plugs/Ear Protection, Reflective Jackets, Dust Mask/Nose Mask, Fire Prevention Kit, Leather Hand Gloves, Jump Suit, Wire Brush, Hand & Leg Guards Leather, Fire Extinguishers, Sand Buckets, Flashback Arrestors, Welding Helmet, Welding Glass

Module 3: Process of performing the fit-up of assemblies

Mapped to CON/N1209 v3.0

Terminal Outcomes:

- Elucidate ways to place and fix the components as per marking.
- Describe the process of carrying out necessary adjustments.
- Elucidate ways to repair any defects found in the components.

Duration: 40:00	Duration: 50:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain how to estimate the requirements of fit-up, e.g. the space required for completing the fit-up work; the number of clamps and fixture required for restricting the movement of sections, etc. • Explain how to check the workability of clamps and fixtures. • State the ideal conditions for an anchor point. • Explain how to decide the anchor points. • Elucidate the need and importance of tack welding. • Explain how to identify the location of tack welding. • Explain the importance of preparing fabrication platform or bed. • Explain the meaning and requirement of root gap. • Describe different methods and process for making connections in metal sections. • Explain how to place and position sections of different shapes, dimensions, etc. • Explain how to align the sections as per the markings. • Elucidate different types of jacks (based on mechanics, principle of functioning, capacity), their application and use. • Explain how to use different jacks, vices, clamps and other fixtures. • Explain the use of different	• Demonstrate how to erect temporary support and anchors at the identified locations as per the work requirement. • Show how to inspect the fabrication bed before commencing the fit-up. • Demonstrate the process of assisting in the preparation of fabrication bed and other fitting activities such as placing and tightening the clamps, jacking and striking, etc. • Demonstrate the process of carrying out operations such as striking, realignment etc. for accurate positioning of structural components. • Show how to check the accuracy of positioning of sections. • Demonstrate the process of assisting the foreman in the preparation of fit-up report.

equipment for load lifting and shifting. ● Elucidate the meaning, causes and physical effects of distortion. ● Describe the procedures employed to correct distortion (application of heat and force). ● Describe the process of bending plates or sections using bending machines. ● Elucidate the types of bending machines, their application and limitations.	

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

Tools, Equipment and Other Requirements

Drilling Machine with Bits, Electric Screw Gun, Electric Hex Saw, Welding Tools and Accessories, Gas Cutting Tools and Accessories, Grinding Tools and Accessories, Pliers, Files, Temperature Gun/Chalk, Clamps and Anchors, Vices, Forklift, Slings, Wire Ropes, Shackles, Spreader Board, Chain, Link, Eye Hook, Eye Bolts, Bull Dog Grips, Clamp, Socket, Metric Tape, Line Dori, Scale, Welding Gauge, Hammer, Punch, Safety Helmet, Safety Goggles, Safety Shoes, Safety Belt, Ear Plugs/Ear Protection, Reflective Jackets, Dust Mask/Nose Mask, Fire Prevention Kit, Leather Hand Gloves, Jump Suit, Wire Brush, Hand & Leg Guards Leather, Fire Extinguishers, Sand Buckets, Flashback Arrestors, Welding Helmet, Welding Glass

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**
• 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.	• 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**
• 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.	• Demonstrate how to follow emergency and evacuation procedures in case of accidents, fires, natural calamities. • Show how to operate different types of fire extinguishers corresponding to various types of fires as per EHS guideline. • 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.

• 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 Construction Fitter

Mandatory Duration: 60:00	Recommended Duration: 00:00
Location: On-Site	
Terminal Outcomes ● Explain the basics of arithmetic and geometry. ● Use linear calculations to calculate the necessary section dimensions and note the orientation of sections. ● Use the appropriate measuring and marking tools and instruments, measuring tape, scribers, etc. ● Erect temporary support and anchors at the identified locations as per the work requirement. ● Carry out operations such as striking, realignment etc. for accurate positioning of structural components. ● Assist the foreman in the preparation of fit-up report. ● 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	2	Fabrication	0	-	
Diploma	Civil/Mechanical/ Electrical	3	Fabrication	0	-	
ITI	Civil/Mechanical/ Electrical	6	Fabrication	0	-	
General BA/BSc./ EX-Army/ 12th	Civil/Mechanical/ Electrical	6				

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role "Construction Fitter ", mapped to QP: "CON/Q1205, 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	5	Fabrication	0	-	
ITI	Civil/Mechanical/ Electrical	7	Fabrication	0	-	

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role "Construction Fitter ", mapped to QP: "CON/Q1205 v3.0", Minimum accepted score is 80%	Recommended that 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