Model Curriculum

QP Name: Bar Bender & Steel Fixer

QP Code: CON/Q0203

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 1.0

Construction Skill Development Council of India|| Construction Skill Development Council of India (CSDCCI), CPB – 103 & 104, Block-4B, DLF corporate Park, Phase – III, MG Road Gurugram – 122002
Near Guru Dronacharya Metro Station

Contents

Training Parameters

Sector	Construction Skill Development Council of India
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Bar Bending & Fixing
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7214.9900
Minimum Educational Qualification and Experience	5th Class with 2-3 Years of experience (should have minimum 2 years' site experience as a certified Assistant Bar Bender & Steel fixer) OR 5th Class with 5-10 Years of experience (a non-trained worker should have minimum 5 years site experience in the bar bending and steel fixing occupation)
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	16/12/2020
Next Review Date	16/12/2025
NSQC Approval Date	
QP Version	Version number 2.0
Model Curriculum Creation Date	01/09/2020
Model Curriculum Valid Up to Date	16/12/2025
Model Curriculum Version	Version number 1.0
Minimum Duration of the Course	400 hrs
Maximum Duration of the Course	400 hrs

Program Overview

This section summarizes 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.

- Explain the role and responsibilities of bar bender and steel fixer.
- Discuss the career progression for the bar bender and steel fixer.
- Interpret reinforcement drawings and sketches, and Bar Bending Schedule (BBS).
- Explain the fixing sequence of reinforcement bars.
- Identify hand and power tools used for marking, cutting and bending of reinforcement bars.
- Demonstrate the use of hand and power tools for cutting of reinforcement bars.
- Demonstrate the use of hand and power tools for bending of reinforcement bars.
- Prepare different reinforcement components required for the cage/ mesh fabrication.
- Demonstrate placement and installation of mechanical couplers.
- Erect temporary supports required to fabricate various RCC structure
- Demonstrate insertion and fixing of the reinforcement bars as per the standard sequence.
- Demonstrate fixing of hanger bars, spacers and chairs as per drawing.
- Demonstrate fixing of pre-fabricated cages.
- Explain different types of stirrups and ties used in bar bending works.
- Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams
- Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task.
- Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality.
- Demonstrate prioritizing of work activities to achieve the desired productivity.
- Demonstrate organizing of resources as per work plan prior to commencement of work.
- Identify various hazards at construction site.
- Use PPE's relevant to bar bending and steel fixing task.
- Perform safe waste disposal at construction site.
- Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines.

Compulsory Modules

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

NOS and Module Details	Theory Duration (Hrs)	Practical Duration (Hrs)	On-the-Job Training Duration (Mandatory) (Hrs)	On-the-Job Training Duration (Recommended) (Hrs)	Total Duration (Hrs)
Bridge Module	8:00	00:00	00:00	00:00	8:00

CON/N0204 Read and understand routine drawings/sketches and Bar Bending Schedule NOS Version No.2.0 NSQF Level 4	12:00	28:00	00:00	00:00	40:00
Demonstrate the reading of drawing /sketches and Bar Bending Schedule	12:00	28:00	00:00	00:00	40:00
CON/N0205 Use hand and power tools for cutting and bending of reinforcement NOS Version No.2.0 NSQF Level 4	12:00	28:00	00:00	00:00	40:00
Demonstrate the use of hand and power tools for cutting and bending of reinforcement	12:00	28:00	00:00	00:00	40:00
CON/N0206 Prepare, fabricate, place and fix reinforcement for R.C.C structures NOS Version No. 2.0 NSQF Level 4	72:00	168:00	00:00	00:00	240:00
Prepare reinforcement components for cage/ mesh fabrication of the R.C.C structures	32:00	80:00	00:00	00:00	112:00
Fixing reinforcement components to fabricate cage/ mesh for the R.C.C structures	40:00	88:00	00:00	00:00	128:00
CON/N8001 Work effectively in a team to deliver desired results at the workplace NOS Version No.6 NSQF Level 4	08:00	16:00	00:00	00:00	24:00
Communicate effectively at workplace	08:00	16:00	00:00	00:00	24:00
CON/N8002 Plan and organize work to meet expected outcomes NOS Version No. 5 NSQF Level 4	08:00	16:00	00:00	00:00	24:00
Prioritise activities and organise resources	08:00	16:00	00:00	00:00	24:00
CON/N9001 Work according to personal	08:00	16:00	00:00	00:00	24:00

health, safety and environment protocol at construction site NOS Version No.6 NSQF Level 4					
Follow safety norms as defined by organization, adopt healthy and safe work practices	**08:00**	**16:00**	**00:00**	**00:00**	**24:00**
Total Duration	**128:00**	**272:00**	**00:00**	**00:00**	**400:00**

Module Details

Module 1: Introduction to the job role of Bar bender and steel fixer

Bridge Module

Terminal Outcomes:

- Explain the role and responsibilities of bar bender and steel fixer.
- Discuss the career progression for the bar bender and steel fixer.

Duration: *08:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the role and responsibilities of a bar bender and steel fixer. • Define the personal attributes required in bar bending and steel fixing occupation. • Explain the future possible progression and career development options of a bar bender and steel fixer.	
Classroom Aids:	
Black/White board, Projector/LED Monitor, other teaching aids	Computer, Registers, Trade specific charts and
Tools, Equipment and Other Requirements	
N/A	

Module 2: Read drawings /sketches and Bar Bending Schedule (BBS)

Mapped to CON/N0204, v2.0

Terminal Outcomes:

- Interpret reinforcement drawings and sketches, and Bar Bending Schedule (BBS).
- Explain the fixing sequence of reinforcement bars.

Duration: *12:00*	**Duration**: *28:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Recognize the details in a reinforcement drawing, such as type and size of reinforcement bar, cover to reinforcement, spacing, chairs requirement etc. • Discuss different grades and diameters of reinforcement bars and binding wires used in construction work. • Convert given units of measurement in the metric system to the imperial system and vice versa relevant to bar bending and steel fixing. • Explain insertion and fixing sequence for different types of R.C.C structures such as slab, beam, column, footing, wall, staircase etc. • Calculate the number of bars, chair and spacer from drawing and bar bending schedule. • Calculate the cutting length for various shapes of reinforcement bars (L-shape, U-Shape) from sketches, drawing and bar bending schedule. • Calculate the deduction for bends. • Calculate the cutting length for Stirrups of various shape (Square, Rectangle, Circle). • Discuss ways to minimize wastage of reinforcement steel.	• Interpret routine drawings and sketches to confirm the details such as diameter, shape, and location of reinforcement bar, cutting length, cover to reinforcement bar, bar description, number of bars, bend of reinforcement bar, etc., within the allotted time. • Interpret bar bending schedule to confirm details such as diameter, shape, and location of reinforcement bar, cutting length, cover to reinforcement bar, bar description, number of bars, bend of reinforcement bar, etc., within the allotted time. • Interpret the BBS and estimate quantity of reinforcement work for relevant RCC structure within the allotted time. •
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Drawings of various types of structures and structural elements, Bar bending schedule sample, Model room	

Module 3: Using hand and power tools for cutting and bending of reinforcement

Mapped to CON/N0205, v.2.0

Terminal Outcome:

- Identify hand and power tools used for marking, cutting and bending of reinforcement bars.
- Demonstrate the use of hand and power tools for cutting of reinforcement bars.
- Demonstrate the use of hand and power tools for bending of reinforcement bars.

Duration: *12:00*	**Duration**: *28:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the hand and power tools used for measuring, marking, cutting, and bending of reinforcement bars. • Explain the use of CNC machine for reinforcement works. • Recognize accessories used for reinforcement cutting and bending machine. • Describe the method of placing reinforcement bars in different types of machine, for cutting and bending. • Explain the importance of maintaining correct body posture while cutting and bending the reinforcement bars. • Describe the standard procedure for tagging and stacking of reinforcement bars. • List the electrical safety measures to be adopted while working with power tools. •	• Arrange the tools and required material resources. • Select accessories to be fixed on the bending machine based on the diameter of reinforcement bar, shape and angle of the bend etc. • Demonstrate the use of marking tools to mark cutting length on reinforcement bars. • Demonstrate the use of hammer and chisel, cutting machine, and other cutting tools to cut reinforcement. • Demonstrate the use of bending lever and bending machine to bend reinforcement bar as per shape and dimension given in BBS. • Demonstrate tagging and stacking of reinforcement bars as per standard procedure. •
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers ,Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Chisel, Hammer, Bar tying hook, Bending lever, Gauge measure, Podger Spanner, Hack saw blade and frame, Steel scale, Try Scale, Spirit level, Plumb bob, Measurement tape, Cutting machine, Bending machine, Threading machine, Reinforcement steel bar, Binding wires, Cover blocks, Wooden planks, Reinforcement bar tying machine, Lifting appliance (Sling, Shackle, Belts), Safety Helmet, Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs, Reflective jackets, Dust mask, Fire Prevention kit	

Module 4: Prepare reinforcement components for cage/ mesh fabrication of the R.C.C structures

Mapped to CON/N0206, v.2.0

Terminal Outcome:

- Prepare different reinforcement components required for the cage/ mesh fabrication.
- Demonstrate placement and installation of mechanical couplers.

Duration: *32:00*	**Duration**: *80:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Distinguish between the different type of reinforcement bars based on type of materials/ range of strength such as Mild Steel, TOR steel, TMT steel, and their application. • Discuss various features of One-way slab and Two-way Slab. • Describe the requirements and methods for providing lap joints to the reinforcement bars. • Calculation of lap length and development length for different diameter of reinforcement bars. • Explain the use and benefits of mechanical couplers. • Explain threading of reinforcement bars for coupler installation.	• Interpret drawings, sketches and BBS to get the details of reinforcement components required for the cage fabrication of various RCC structures. • Demonstrate cutting and bending of the reinforcement bar to prepare the materials for the cage fabrication as per the required RCC structure. • Demonstrate lapping of reinforcement for different diameter of reinforcement bars. • Demonstrate fixing of mechanical couplers as per drawing/BBS. • Perform tagging and stacking of prepared reinforcement materials as per the standard procedure.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Bar tying hook, Bending lever, Hack saw blade and frame, Measurement tape, Cutting machine, Bending machine, Threading machine, , M.S, TOR steel, TMT steel Binding wires, Steel cutting blade, Mechanical coupler, Cover blocks, Wooden planks, Reinforcement bar tying machine, Lifting appliance (Sling, Shackle, Belts), Safety Helmet , Safety goggles , Safety shoes , Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit	

Module 5: Fixing reinforcement components to fabricate cage/ mesh for the R.C.C structures

Mapped to CON/N0206, v.2.0

Terminal Outcome:

- Erect temporary supports required to fabricate various RCC structure
- Demonstrate insertion and fixing of the reinforcement bars as per the standard sequence.
- Demonstrate fixing of hanger bars, spacers and chairs as per drawing.
- Demonstrate fixing of pre-fabricated cages.
- Explain different types of stirrups and ties used in bar bending works.

Duration: *40:00*	**Duration**: *88:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the insertion and fixing sequence of different types of R.C.C structural elements such as beam, column, slab, wall, footing, staircase etc. • Classify the different types of ties based on their use and strength. • Explain the importance of chairs, spacer bars, hanger bars, and cover blocks while cage fabrication and concreting operation for various RCC structures. • Discuss the procedure to shift, position and fix the pre-fabricated cage to its designated place.	• Interpret drawings and sketches prior to fabrication and fixing of reinforcements bars • Erect temporary supports/ mark necessary layout required to fabricate cage/ mesh for various RCC structures such as beam, column, slab, wall, footing, staircase etc. • Demonstrate marking procedures, insertion of different reinforcement components (such as bars, stirrups, bent-up bars etc.) and providing initial fixing ties to fabricate the required cage for the various RCC structures such as beam, column, slab, wall, footing, staircase etc. as per the drawing/BBS. • Use different types of ties as per their utilities to fix the different components of the RCC structure. • Demonstrate the shifting, positioning and fixing of pre-fabricated cages as per the requirement. • Demonstrate placing and fixing of chairs, spacers and hanger bars.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Bar tying hook, Bending lever, Hack saw blade and frame, Measurement tape, Cutting machine, Bending machine, Threading machine, , M.S, TOR steel, TMT steel Binding wires, Steel cutting blade, Mechanical coupler, Cover blocks, Wooden planks, Reinforcement bar tying machine, Lifting appliance (Sling, Shackle, Belts), Safety Helmet , Safety goggles , Safety shoes , Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit	

Module 6: Communicate effectively at workplace

Mapped to CON/N8001, v.6.0

Terminal Outcomes:

- Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams
- Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task.
- Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality.

Duration: *08:00*	**Duration**: *16:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the effects and benefits of timely actions relevant to the task at hand with examples. • Explain the importance of teamwork and its effects relevant to the task at hand with examples. • Explain the importance of proper and effective communication and its adverse effects in case of failure of proper communication. • Discuss about gender and its related concept: gender equality, gender equity (group work) • Discuss different types of disabilities (physical, mental, intellectual or sensory impairment). • Discuss the activities sensitive to the cultural diversity, disabilities and gender neutrality at the workplace. • Discuss the basic rules and regulations related to gender sensitivity, disabilities, and cultural diversity, with their impact on operations of a workplace. • Discuss how to take initiative in resolving issues among co-workers in a given situation. • Discuss reporting procedure followed at the workplace.	• Apply effective communication skills while interacting with co-workers, trade seniors and others during the assigned task. • Use appropriate writing skills and verbal communication reporting as per commonly applicable organisational norms. • Demonstrate teamwork skills during assigned task. • Demonstrate acceptable interpersonal transactions with individuals having disabilities (physical, mental, intellectual or sensory impairment) or cultural diversity. • Demonstrate the process modifications required to make the workplace free from gender biases.
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	
N/A	

Module 7: Prioritise activities and organise resources

Mapped to CON/N8002, v.5.0

Terminal Outcomes:

- Demonstrate prioritizing of work activities to achieve the desired productivity.
- Demonstrate organizing of resources as per work plan prior to commencement of work.

Duration: *08:00*	**Duration**: *16:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain methods to upkeep, store and stack tools, materials used for domain specific works. • Explain the process of planning of the given tasks and activities relevant to the trade/job role within defined scope and duration. • Explain the procedure adopted for prioritizing an activity and sequencing of activities. • Explain the work plan and flow of activities in sequence for the assigned work. • Explain basic concept of labour productivity and work productivity. • Explain requisition of resources, reporting for requirement of resources orally and in written to concerned authority. • Explain how to minimise wastage of resources. • Explain the plan for waste collection and disposal after task.	• Identify the work target and plan activities to achieve the desired productivity. • Demonstrate requisition of resource citing an example. • Demonstrate the planning for various activities relevant to task as per the scope and schedule. • Demonstrate how to organise the required tool, manpower and material resources for the assigned task. • Select required quantity of materials, tools or devices for defined work activities. • Demonstrate how to prioritize all works/ activities to maximise output. • Demonstrate optimum use of resources while performing domain specific work activities. • Demonstrate waste collection and disposal as per organisational norms. • Demonstrate completion of work within stipulated time and plan.
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	
N/A	

Module 8: Follow safety norms as defined by organization, adopt healthy and safe work practices

Mapped to CON/N9001, v.6.0

Terminal Outcome:

- Identify various hazards at construction site.
- Use PPE's relevant to bar bending and steel fixing task.
- Perform safe waste disposal at construction site.
- Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines.

Duration: *08:00*	**Duration**: *16::00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the types of hazards at the construction sites and identify the hazards specific to the domain related works. • Recall the safety control measures and actions to be taken under emergency situation. • Explain the classes of fire and types of fire extinguishers. • Explain the importance of participation of workers in safety drills. • Explain the reporting procedure to the concerned authority in case of emergency situations. • Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories. • Explain different types of waste at construction sites and their disposal method. • Explain the purpose and importance of vertigo test at construction site. • List out basic medical tests required for working at construction site. • Explain the types and benefits of basic ergonomic principles, which should be adopted while carrying out specific task at the construction sites. • Explain the importance of housekeeping works. • List different types of infectious disease that can spread/ originate at a construction site • Discuss the ways of transmission of the various infectious disease.	• Demonstrate the operating procedure of the fire extinguishers. • Demonstrate use of PPEs as per work requirements. • Demonstrate vertigo test. • Demonstrate safety techniques to be adopted in case of accidents. • Demonstrate safe waste disposal practices followed at construction site. • Demonstrate safe housekeeping practices. • Demonstrate the practices to maintain personal hygiene, workplace hygiene and site/ workplace sanitization. • Demonstrate the methods to clean and disinfect all materials, tools and supplies before and after use. • Demonstrate the procedure to report to the concerned authority regarding the outbreak/ hazard of any infectious disease/ pandemic.

• Explain the methods to check the spread of the infectious disease. • Describe the symptoms and cure of the various infectious disease.	
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 & 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	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post-Graduation/ Graduation in Engineering	M. Tech in Civil/B. Tech in civil	Two	Civil Engineering	0	Civil Engineering	As a pre-requisite for new entrant, no prior experience in training /assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience.
Diploma	Diploma in Civil	Three	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12th pass	Six	Working as bar bender/bar bending and fixing domain/supervisory work of bar bending and steel fixing domain	0	Working as bar bender/bar bending and fixing domain/supervisory work of bar bending and steel fixing domain	

Trainer Certification	
Domain Certification	**Platform Certification**
Trainer- 70 % in each NOS of Qualification Pack "Bar bender and steel fixer CON/Q0203 v2.0" & 80% overall.	Trainers - 80% in each NOS of Qualification Pack "Trainer MEP/Q2601, v1.0"and 80% overall.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post-Graduation/ Graduation in Engineering	M. Tech in Civil/B. Tech in civil	Two	Civil Engineering	0	Civil Engineering	As a pre-requisite for new entrant, no prior experience in training /assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience.
Diploma	Diploma in Civil	Five	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12th pass	Seven	Working as bar bender/bar bending and steel fixing domain/supervisory work of bar bending and fixing domain	0	Working as bar bender/bar bending and steel fixing domain/supervisory work of bar bending and fixing domain	

Assessor Certification	
Domain Certification	**Platform Certification**
Assessor- 70% in each NOS of Qualification Pack "Bar bender and steel fixer CON/Q0203 v2.0" & 80% overall	Assessors- 80% in each NOS of Qualification Pack "Assessor MEP/Q2701, v1.0"and overall 80%.

Assessment strategy

Assessment system Overview

Assessment is done through CSDCI affiliated Assessment Agencies. Assessors are trained & certified by CSDCI after training of assessors' program. Assessments is conducted to gauge and assess the trainee's skill and knowledge competency in the specified areas. The assessment will have both theory and practical component 30:70 ratios for bar bender and steel fixer job role.

During the practical task, trainees are assessed on their workmanship, quality of finished product and time management. They will be graded for all their assessments based on the approved assessment strategy which is signed off by CSDCI. The Assessor submits an assessment plan to CSDCI prior to assessments.

The assessment plan contains the following information:

- What will be assessed, i.e. the competency based on each NOS based on theory and practical questions
- How assessment will occur i.e. methods of assessment
- When the assessment will occur
- duration of assessment
- Where the assessment will take place i.e. context of the assessment (workplace/simulation)
- The criteria for decision making i.e. those aspects that will guide judgments and
- Where appropriate, any supplementary criteria used to make a judgment on the level of performance.

Testing Environment

Training partner shares the batch start date and end date, number of trainees and the job role.

Assessment will be fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue/test center.

The knowledge/theory assessments are conducted with proper seating arrangements with enough space between the candidates to prevent copying.

Question set for theory and practical will be distributed to each candidate by the Assessor. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on his theoretical knowledge of the subject. The skill /practical assessments will be conducted in the approved test centers. The training provider will ensure adequate tools and materials are available to conduct the practical test.

If number of candidates are more than 30, more assessors will be organized on same day to complete the assessment.

The assessment has to comprise of two components, namely:
1. Knowledge assessment (theory/viva assessment)
2. Skill assessment (practical/hands-on skill assessment)

Mode of assessment

1. Demonstration/Practical for Performance /Skill Assessment
2. Synoptic multiple-choice question test } for Knowledge Assessment
3. Viva

Performance/skill assessment: The performance/skill assessment will be conducted through demonstration/practical.

For the practical test trainees are assessed through a given task, which they have to complete correctly for them to be marked as passed.

The assessment is conducted in a simulated working environment. Due to this fact, the assessors must note that the naturally occurring evidence of competence is unavailable or infrequent. Simulation must be undertaken in a Realistic Working Environment which provides an environment that replicates the key characteristics of the workplace in which the skill to be assessed is normally employed**.**

Knowledge Assessment: The knowledge assessments are conducted through written test/ viva.

Synoptic test is used for this. It is an MCQ (Multiple Choice Question) test which are prepared externally and externally marked, meaning by agency having no link with training partners. The test may be conducted by the assessor in the oral mode, if required, considering the lack of reading and comprehending acumen (skills) of trainees. In such cases, the assessor will mention it on top of the MCQ submitted to CSDCI.

The assessment strategy, weightage and duration of assessment for bar bender and steel fixer is summarized below:

Assessment Type	**Formative or Summative**	**Strategies**	**Weightage**	**Duration (hours)**
Knowledge	Summative	MCQ/Viva	30	1.5
skill	Summative	Structured practical task	70	5.5

Assessment Quality Assurance framework

CSDCI has developed assessment criteria framework for each Qualification pack as per National Occupational Standards. The criteria framework includes weightages/marks for each criterion under knowledge and skill. The criterion ensures quality assurance as it ensures valid, consistent and fair assessments at all locations. Issued to the affiliated Assessment body. The Assessment body develop questions based on CSDCI issued assessment criteria.

Evidences in the form of answer sheets in case of knowledge assessments are collected. For skill assessments videos and photographs are prepared as evidence. These are submitted by the assessor

to the assessment agency. CSDCI does random checks of the same with the participant/ trainee's ID and ascertains authenticity and validity of assessments.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue. Random spot checks/audit are conducted by CSDCI to monitor assessment.

Methods of Validation

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, ID verification is carried out. Aadhar card number is part of registering the candidate for training. This forms the basis of further verification during the assessment.

Assessor conducts the assessment through theory and practical questions developed in accordance with the assessment criteria and guidelines issued by CSDCI. This too is verified by random audits carried out by CSDCI.

Evidences for assessments are to be collected and submitted to CSDCI for verification as per demand.

Assessment agency is responsible to put details in SIP. CSDCI will also validate the data and result received from the assessment agency.

Method of assessment documentation and access

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by CSDCI assessment team. After upload, only CSDCI can access this data.

CSDCI approves the results within five days after which results are uploaded on SIP by Assessment Agency.

References

Glossary

Term	Description
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).
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **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.
TOR Steel	Cold Twisted Deformed steel
TMT Steel	Thermo Mechanical Treated bar
MS	Mild-Steel
BBS	Bar Bending Schedule
LED	Light-Emitting Diode
CON	Construction
MCQ	Multiple Choice Questions
VIVA	Viva voce (means oral exam)
CNC machine	Computer Numerical Control

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
RCC	Reinforced Cement Concrete
Rebars	Reinforcement bars
PPEs	Personal Protective Equipment
SIP	Skill India Portal