Model Curriculum

Assistant Bar Bender & Steel Fixer

SECTOR: Construction  
SUB-SECTOR: Real Estate and Infrastructure Construction  
OCCUPATION: BAR BENDING AND FIXING  
REF ID: CON/Q0202, Version 2.0  
NSQF LEVEL: 3
Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

CONSTRUCTION SKILL DEVELOPMENT COUNCIL OF INDIA

for the

MODEL CURRICULUM

Complying to National Occupational Standards of

Job Role/Qualification Pack: ‘Assistant Bar Bender & Steel Fixer’ OP No. ‘CON/ C 0203, V2.0 NSQF Level 3’

Date of issuance: August 16th, 2019

Valid up to: July 15th, 2023

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

[Signature]

Authorised Signatory
(Construction Skill Development Council of India)
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# Assistant Bar Bender & Steel Fixer

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Assistant Bar Bender & Steel Fixer”, in the “Construction” Sector/Industry and aims at building the following key competencies amongst the learner.

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Assistant Bar Bender &amp; Steel Fixer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualification Pack Name &amp; Reference ID. ID</td>
<td>CON/Q0202 Version 2.0</td>
</tr>
<tr>
<td>Version No.</td>
<td>2.0</td>
</tr>
<tr>
<td>Pre-requisites to Training</td>
<td>NIL</td>
</tr>
</tbody>
</table>
| Training Outcomes | After completing this programme, participants will be able to:  
- Interpret reinforcement bar detail from hand sketches  
- Use materials, tools, and equipment relevant to reinforcement works  
- Cut reinforcement bars and bend them manually in simple shapes  
- Fabricate, place and fix reinforcement bar for pre-fabricated and in-situ RCC Structures  
- Erect and dismantle temporary scaffold up to 3.6 m height  
- Interact and communicate effectively with co-workers, superiors and subordinates across different teams  
- Follow safety norms as defined by organization, adopt healthy and safe work practices. |
This course encompasses 7 out of 7 National Occupational Standards (NOS), “Assistant Bar Bender & Steel Fixer” Qualification Pack issued by “Construction skill sector council of India”.

## Compulsory NOS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Module</th>
<th>Key Learning Outcomes</th>
<th>Equipment Required</th>
</tr>
</thead>
</table>
| 1       | Introduction to bar bending and steel fixing occupation | • Define the role of an assistant bar bender and steel fixer  
• Explain the personal attributes required to be an assistant bar bender and steel fixer  
• Recall the basic terms used in the occupation of bar bending and steel fixing  
• Discuss future possible progression and career options for assistant bar bender and steel fixer |  |
|         | Theory Duration (hh:mm) 08:00 |  |  |
|         | Practical Duration (hh:mm) 00:00 |  |  |
|         | Corresponding NOS Code Bridge Module |  |  |
| 2       | Interpret reinforcement bar detail from hand sketches | • List different systems of linear measurement  
• Apply the basic knowledge of units, measurement and arithmetic calculation relevant to bar bending work  
• Describe the different types of reinforcement bars, their grade and standard size  
• Determine diameter, cutting length, cover, number and shape of reinforcement bars from hand sketch  
• Determine spacing details for stirrups, chairs, space bars etc. by interpreting hand sketches relevant to bar bending works. |  |
|         | Theory Duration (hh:mm) 08:00 |  |  |
|         | Practical Duration (hh:mm) 24:00 |  |  |
|         | Corresponding NOS Code CON/N0214 |  |  |
| 3       | Use materials, tools, and equipment relevant to reinforcement works | • Classify the reinforcement bar with respect to their grade and size.  
• Differentiate binding wires based on materials and thickness  
• Identify the different types of hand tools and power tools used for steel reinforcement works.  
• Demonstrate the use of hand tools for cutting rebars.  
• Demonstrate the use of power tools like circular cutting machine (handheld and table mounted) and shearing machine for cutting rebar.  
• Describe the process adopted for care and maintenance of hand and power tools used in bar bending works.  
• Demonstrate the use of threading machine for marking threads on reinforcement bars. | 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 |
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Module</th>
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<th>Equipment Required</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>• Demonstrate the use of bar bending machine.</td>
<td>• Reinforcement bar tying machine</td>
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<tr>
<td></td>
<td></td>
<td>• Explain use of lifting gears and equipment used in reinforcement work</td>
<td>• Lifting appliance (Sling, Shackle, Belts)</td>
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<td></td>
<td></td>
<td>• Demonstrate the use of slings, shackles and lifting belts for lifting and shifting of rebar</td>
<td>• Safety Helmet</td>
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<td></td>
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<td>• State the importance of maintaining proper body postures while using hand and power tools</td>
<td>• Safety goggles</td>
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<td></td>
<td></td>
<td>• Reinforcement bar tying machine</td>
<td>• Safety shoes</td>
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<tr>
<td></td>
<td></td>
<td>• Lifting appliance (Sling, Shackle, Belts)</td>
<td>• Safety belt</td>
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<td></td>
<td></td>
<td>• Safety Helmet</td>
<td>• Cotton gloves</td>
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<td>• Safety goggles</td>
<td>• Ear plugs</td>
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<td>• Safety shoes</td>
<td>• Reflective jackets</td>
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<td></td>
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<td>• Safety belt</td>
<td>• Dust mask</td>
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<td>• Cotton gloves</td>
<td>• Fire Prevention kit</td>
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<td>• Ear plugs</td>
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<td>• Reflective jackets</td>
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<td></td>
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<td>• Fire Prevention kit</td>
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<td></td>
<td>Cut reinforcement bars and bend them manually in simple shapes</td>
<td>• Explain the procedure of measuring, marking and cutting of reinforcement bars into simple shapes.</td>
<td>• Hack saw</td>
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<tr>
<td>4</td>
<td></td>
<td>• List the types of stirrups, chairs and hanger bar</td>
<td>• Rail piece</td>
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<td></td>
<td></td>
<td>• Describe tolerance limit for cutting and bending of the reinforcement bar</td>
<td>• Pointed chisel</td>
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<td></td>
<td>• Explain the importance of maintaining proper body posture while cutting and bending reinforcement bars</td>
<td>• Sledge hammer</td>
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<td></td>
<td></td>
<td>• Demonstrate marking and cutting of rebar to the specified length using appropriate hand cutting tools.</td>
<td>• Bending lever</td>
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<td></td>
<td></td>
<td>• Demonstrate marking and cutting of rebar to the specified length using appropriate power cutting tools.</td>
<td>• Pin plate</td>
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<td></td>
<td></td>
<td>• Demonstrate bending of reinforcement bar to the specified shape and angle using lever/pipe.</td>
<td>• Working bench</td>
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<td>• Apply basic ergonomic principles while cutting and bending of the reinforcement bars</td>
<td>• Measuring Instruments</td>
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<td></td>
<td>• Demonstrate the procedure of making stirrups, chairs and hanger bars</td>
<td>• Measurement tape</td>
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<td>• Hack saw</td>
<td>• Cutting machine</td>
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<td></td>
<td></td>
<td>• Rail piece</td>
<td>• Bending machine</td>
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<td></td>
<td></td>
<td>• Pointed chisel</td>
<td>• Steel cutting blade</td>
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<td></td>
<td></td>
<td>• Sledge hammer</td>
<td>• Reinforcement bar tying machine</td>
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<td>• Bending lever</td>
<td>• Lifting appliance (Sling, Shackle, Belts)</td>
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<td>• Pin plate</td>
<td>• Safety Helmet</td>
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<td></td>
<td></td>
<td>• Working bench</td>
<td>• Safety goggles</td>
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<tr>
<td></td>
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<td>• Measuring Instruments</td>
<td>• Safety shoes</td>
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<td>• Safety belt</td>
<td>• Safety belt</td>
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<td>• Cotton gloves</td>
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<td>• Ear plugs</td>
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<td>• Dust mask</td>
<td>• Dust mask</td>
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<td></td>
<td>• Fire Prevention kit</td>
<td>• Fire Prevention kit</td>
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<td></td>
<td>Fabricate, place and fix reinforcement bar for pre-fabricated and in-situ RCC Structures</td>
<td>• List the different types of ties (Slash tie, ring slash tie, hair-pin tie, ring hair-pin tie, crown tie, lap tie) used in bar bending works</td>
<td>• Hack saw</td>
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<tr>
<td>5</td>
<td></td>
<td>• Hack saw</td>
<td>• Rail piece</td>
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<tr>
<td></td>
<td></td>
<td>• Rail piece</td>
<td>• Pointed chisel</td>
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<td></td>
<td></td>
<td>• Pointed chisel</td>
<td>• Sledge hammer</td>
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<td></td>
<td></td>
<td>• Sledge hammer</td>
<td>• Bending lever</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Module</td>
<td>Key Learning Outcomes</td>
<td>Equipment Required</td>
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</table>
| (hh:mm) | 24:00  | **Practical Duration** (hh:mm) 62:00 | • Describe the sequence for tying of reinforcement bar in case of in-situ and pre-fabricated cages  
• Explain the importance of lapping and staggering of reinforcement bars  
• Describe the standard method of staggering of reinforcement bars.  
• Explain use of chairs, hanger bar, spacer bar and cover blocks  
• Demonstrate placing and fixing of chairs as per requirement for the slab reinforcement.  
• Describe insertion and fixing sequence for footing, column, wall, beam and slab  
• Demonstrate insertion and fixing of rebar for column, slab, beam and wall.  
• Demonstrate fixing ties using hair pin tie, ring hair pin tie, slash tie, ring slash tie and crown tie.  
• Demonstrate marking, placing, fixing and tying of stirrups for column, beam, wall & slab as per the specified spacing. | • Pin plate  
• Working bench  
• Binding hook  
• Measurement tape  
• Chalk piece  
• Cutting machine  
• Bending 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 |
| 6       | **Erect and dismantle temporary scaffold up to 3.6-meter height** | **Theory Duration** (hh:mm) 12:00 | • Explain scaffolding and its purpose  
• List the common materials and tools used for erection of scaffolding (pipe, cup lock (vertical and ledgers), H- frames, bamboo and balli  
• List the functions of different hand tools like hammer, spanner, pulleys, hooks, ropes, etc., used for erection/ dismantling of scaffolds  
• List the visual checks to be carried out on the scaffolding components to ascertain their usability  
• Identify different components of a temporary scaffolding such as base, toe board, guard rails, platform, walkways, ladder and so on  
• Explain the functions of materials, components and accessories used in scaffolding  
• Demonstrate preparation of scaffolding base | • Hammer  
• Spanner (set)  
• Wrench  
• Pulley  
• Rope  
• Nuts and bolts  
• Measuring tape  
• Spirit level  
• Plumb-bob  
• Mason’s line  
• Helmet  
• Safety shoes  
• Safety belt  
• Cotton hand gloves  
• Goggles  
• Reflective jackets |
<p>|         | <strong>Erection Code</strong> CON/N0217 | <strong>Corresponding NOS Code</strong> CON/N0217 | | |</p>
<table>
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<th>Equipment Required</th>
</tr>
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</table>
| 7      | Work effectively in a team to deliver desired results at the workplace | - Demonstrate effective communication skills while interacting with co-workers, trade seniors and others during the assigned task.  
- Interpret work sketches, formats, permits, protocols, checklists and other work-related requirements which are to be conveyed to other team members  
- Demonstrate effective reporting to seniors while performing the assigned work as per applicable organisational norms  
- Explain effects and benefits of timely actions relevant to bar bending works with examples  
- Explain importance of team work and its effects relevant to bar bending works with examples  
- Demonstrate team work skills during assigned task. | Safety shoes  
- Safety Goggles  
- Safety Helmet  
- Cotton Hand - Gloves  
- Tools Bag  
- Safety Belt  
- Face Mask  
- Operator – Leather Apron  
- Safety Shoes (Assorted Size)  
- Ear Muff |
| 8      | Work according to personal health, safety and environment protocol at construction site | - Explain the types of hazards at the construction sites  
- Identify the hazards specific to the bar bending and steel fixing work  
- Recall the safety control measures and actions to be taken under emergency situation  
- Explain the classes of fire and types of fire extinguishers  
- Demonstrate the operation of fire extinguisher.  
- Demonstrate different methods involved in providing first aid to the affected person.  
- Explain the importance of worker participation in safety/mock drills | Safety shoes  
- Safety Goggles  
- Safety Helmet  
- Cotton Hand - Gloves  
- Tools Bag  
- Safety Belt  
- Face Mask  
- Operator – Leather Apron  
- Safety Shoes (Assorted Size)  
- Ear Muff |
<table>
<thead>
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<th>Equipment Required</th>
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</thead>
</table>
|        | CON/N9001                   | • Demonstrate the use of all Personal Protective Equipment (PPE) like helmet, safety shoe, safety belt, safe jackets and other safety equipment relevant to bar bending work.  
              • Explain the reporting procedure adopted in case of emergency situations  
              • Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories  
              • Explain different types of wastes produced at a construction site including their disposal method  
              • Explain the purpose and importance of vertigo test at construction site  
              • Demonstrate vertigo test  
              • List out basic medical tests required for working at construction Site  
              • Explain the types of ergonomic principles adopted while carrying out specific task at the construction  
              • Explain the benefits of basic ergonomic principles used at construction sites.  
              • Explain the importance of housekeeping  
              • Demonstrate housekeeping practice followed after reinforcement works. | • Reflective jackets  
              • Safety message boards  
              • Fire extinguishers  
              • Sand buckets |

**Total Duration**
**Theory Duration:** 104:00 hours  
**Practical Duration:** 246:00 hours

**Grand Total Course Duration:** 350 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by Construction Skill Development Council of India)
Trainer Prerequisites for Job role: “Assistant Bar Bender & Steel Fixer” mapped to Qualification Pack: “CON/Q0202, Version 2.0”

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<tr>
<th>Sr. No.</th>
<th>Area</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Description</td>
<td>To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “CON/Q0202 Version 2.0”.</td>
</tr>
<tr>
<td>2</td>
<td>Personal Attributes</td>
<td>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.</td>
</tr>
<tr>
<td>3</td>
<td>Minimum Educational Qualifications</td>
<td>ITI/12th</td>
</tr>
<tr>
<td>4a</td>
<td>Domain Certification</td>
<td>Certified for the job role “Assistant Bar Bender &amp; Steel Fixer” mapped to QP: “CON/Q0202 Version 2.0” Minimum accepted score is 80%</td>
</tr>
<tr>
<td>4b</td>
<td>Platform Certification</td>
<td>Certified for the job role “Trainer” mapped to QP: “MEP/Q2601” Minimum accepted score is 80%</td>
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</tbody>
</table>
| 5       | Experience                    | i. Technical Degree holder with minimum three years of Field experience and preferably two years of teaching experience or,  
      |                                | ii. In case of a Diploma Holder five years of field experience and preferably two years of teaching experience or,  
      |                                | iii. In case of ITI/12th pass minimum eight years of field experience and preferably two years of teaching Experience. |

Note: For the Assessment Criteria please refer to the QP PDF