

BAR BENDER & STEEL FIXER - NSQF LEVEL: 4

CURRICULUM / SYLLABUS – Course Duration: 68 Hours Bridge Course

Qualification Pack Name & Reference ID. - CON/Q0203

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

Training Outcomes

After completing this programme, participants will be able to:

- Read and understand routine drawings/sketches and Bar Bending Schedule:- Basic concepts of drawings/sketches and Bar Bending Schedule used in routine works
- Use hand and power tools for cutting and bending of reinforcement :- Selection and use of hand and power tools for reinforcement steel cutting and bending
- Prepare, fabricate, place and fix reinforcement for R.C.C structures: Methods and standard procedure for fabricating, placing and fixing of reinforcement steel for R.C.C structures
- Work effectively in a team to deliver desired results at the workplace :- Organised working procedure within a team at site
- Plan and organize work to meet expected outcomes: - Prioritizing activities and organising resources to meet desired outcome
- Work according to personal health, safety and environment protocol at construction site:- Importance of Health & Safety aspects & measures to be followed while working.
- Work effectively in a team to deliver desired results at the workplace: - Organised working procedure within a team at site

S.No.	Module	Key Learning Outcomes	Equipment Required
1	Introduction to the job role - (Lecture/ description by concerned trainer) Theory Duration (hh:mm) 01:00	<ul style="list-style-type: none">• Role description/ functions of the job role• Expected personal attributes from the job role• Brief description about course content, mode of learning and duration of course• Future possible progression and career development provisions on completion of the course	<u>Seating arrangement for</u> 1. participants 2. Black/White board 3. Projector/LED Monitor 4. Trade specific charts and other teaching aid
2	Read and understand routine drawings/sketches and Bar Bending Schedule Theory Duration (hh:mm) 2:00	Theory:- <ul style="list-style-type: none">• Understanding Drawings/sketches• Various detail provided in drawings (Type of rebar, size of rebar, cover to reinforcement, spacing, chairs requirement)• Understanding Bar Bending Schedule• Calculation of number of bars, stirrups , chairs, spacer bar based on the spacing	<u>Drawings/Sketches</u> 1. Drawings of various types of structures and structural elements 2. Bar bending schedule sample

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	<p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code CON/N0204</p>	<ul style="list-style-type: none"> • Calculation of cutting length for various shapes of rebars (L-shape, U-Shape) from sketches, drawings • Calculation of cutting length from Bar Bending schedule • Calculation of cutting length for Stirrups of various shape (Square, Rectangle, Circle) • Minimizing wastage of reinforcement steel <p>Demonstration/ Practical : -</p> <ul style="list-style-type: none"> • Reading of routine drawings/sketches • Find out the details provided in the drawings/sketches such as diameter of rebar, shape of rebar, location of rebar, cutting length, cover to rebar etc. • Calculation of cutting length from drawings/sketches • Calculation of cutting length from Bar Bending Schedule 	
3.	<p>Use hand and power tools for cutting and bending of reinforcement</p> <p>Theory Duration (hh:mm) 2:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code CON/N0205</p>	<p>Theory:-</p> <ul style="list-style-type: none"> • Selection of tool and power tools for cutting of reinforcement (Hammer & chisel, Hack saw, hand cutting machine, circular cutting machine, bar shearing machine) • Accessories used for reinforcement cutting and bending machine • Method of placing rebar in different types of machine for cutting of rebars • Importance of correct body posture while doing cutting and bending of reinforcement • Standard procedure for tagging and stacking of reinforcement steel <p>Demonstration/ Practical :-</p> <ul style="list-style-type: none"> • Select tool for cutting of reinforcement bar based on diameter of rebar • Select bending lever for bending of rebar based on the diameter of rebar • Cut rebar using hammer and chisel and maintain correct body posture while cutting • Cut rebar using cutting machine and maintain correct body posture while cutting • Bend rebar using bending lever and maintaining correct body posture • Bend rebar using bending machine and maintaining correct body posture • Demonstrate tagging and stacking of rebar as per standard procedure 	<p><u>Hand Tools</u></p> <ol style="list-style-type: none"> 1. Chisel 2. Hammer 3. Bar tying hook 4. Bending lever 5. Gauge measure 6. Podgier Spanner 7. Hack saw blade and frame <p><u>Measuring Instruments</u></p> <ol style="list-style-type: none"> 8. Plumb bob 9. Measurement tape 10. Power Tools 11. Cutting machine 12. Bending machine 13. Threading machine <p><u>General requirement</u></p> <ol style="list-style-type: none"> 14. Reinforcement steel bar 15. Binding wires 16. Cover blocks 17. Rebar tying machine Lifting appliance (Sling, Shackle, Belts) <p><u>PPEs</u></p> <ol style="list-style-type: none"> 18. Safety Helmet 19. Safety goggles 20. Safety shoes, Safety belt 21. Cotton gloves 22. Ear plugs 23. Reflective jacket
4	<p>Prepare, fabricate, place and fix reinforcement for R.C.C structures</p> <p>Theory Duration (hh:mm) 3:00</p>	<p>Theory:-</p> <ul style="list-style-type: none"> • Importance of specification provided in drawings • One-way and Two-way Slab • Lapping of reinforcement bar, purpose and calculation for lapping length 	<p><u>Hand Tools</u></p> <ul style="list-style-type: none"> • Bar tying hook • Bending lever • Hack saw blade and frame <p><u>Measuring Instruments</u></p> <ul style="list-style-type: none"> • Measurement tape <p><u>Power Tools</u></p>

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	<p>Practical Duration (hh:mm) 18:00</p> <p>Corresponding NOS Code CON/N0206</p>	<ul style="list-style-type: none"> • Different types of ties and their purpose for tying of different types of R.C.C structural element • Use of mechanical coupler • Use of chairs, spacer bar and hanger bars • Clear cover to reinforcement steel for various R.C.C structural element for normal condition and importance of providing cover • Tolerance limits for reinforcement work • Types of cutting blades and quality check • Basics of concreting and shuttering works • Types of rebars based on material (M.S, TOR steel, TMT steel) , Grade • Electrical safety of power tools and equipments for bar bending works <p>Demonstration/ Practical : -</p> <ul style="list-style-type: none"> • Read and extract rebar detail from drawings • Demonstrate insertion and fixing procedure for various R.C.C structural element such as beam, column, slab, wall, footing, staircase etc. • Mark, Place and fix rebar as per drawings • Demonstrate lapping of reinforcement for different diameter of rebar • Demonstrate fixing of mechanical coupler • Demonstrate placing and fixing of chair, spacer and hanger bar • Demonstrate Do's and Don't related to electrical safety of power tools • Check quality of reinforcement work in reference to right diameter of rebar use, placement, spacing and tying of rebar • Demonstrate how to tie stiffeners in Prefabricated cages • Demonstrates placement of rebar in case of One-way and Two-way slab 	<ul style="list-style-type: none"> • Cutting machine • Bending machine • Threading machine <p><u>General requirement</u> M.S, TOR steel, TMT steel Binding wires Steel cutting blade Mechanical coupler Cover blocks Wooden planks Rebar tying machine Lifting appliance (Sling, Shackle, Belts)</p> <p><u>PPEs</u> Safety Helmet Safety goggles Safety shoes Safety belt Cotton gloves Ear plugs Reflective jackets Dust mask Fire Prevention kit</p>
<p>5.</p>	<p>Work effectively in a team to deliver desired results at the workplace</p> <p>Theory Duration (hh:mm) 01:00</p> <p>Practical Duration (hh:mm) 04:00</p> <p>Corresponding NOS Code CON/N8001</p>	<p>Theory:-</p> <ul style="list-style-type: none"> • Method of oral and written communication skills with co-workers related to cutting, bending and tying works • Reading and interpretation of sketches • How to understand and follow work methods, by adhering to instructions or consulting with seniors • Seek necessary support and complete assigned tasks within stipulated time duration • Keep good relation and maintain well behaviour with co-workers <p>Demonstration/ Practical : -</p> <ul style="list-style-type: none"> • The skills will be developed and practiced while carrying out following trade related 	

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		<p>activities in a predictable and familiar working condition</p> <ul style="list-style-type: none"> • Handling material, tools and equipment's relevant to reinforcement works • Carrying out cutting and bending of rebar • Carrying out fabrication, placing and fixing of reinforcement for R.C.C structures • Selection and handing over of desired/ appropriate tools/ materials while assisting trade senior 	
6.	<p>Plan and organize work to meet expected outcomes</p> <p>Theory Duration (hh:mm) 01:00</p> <p>Practical Duration (hh:mm) 04:00</p> <p>Corresponding NOS Code CON/N8002</p>	<p>Theory:-</p> <ul style="list-style-type: none"> • Basic concept of productivity, sequence of working and implementation of safety and organizational norms while working • Optimization of resources • To plan reinforcement activities within defined scope of work • Upkeep, storing and stacking methods of tools, materials used for domain specific works • Importance of housekeeping <p>Demonstration/ Practical :</p> <ul style="list-style-type: none"> • The skills will be developed and practiced while carrying out following trade related activities in a predictable and familiar working condition • Handling material, tools and equipment's relevant to reinforcements works • Prioritize all works/ activities • Planning cutting and bending activities • Carrying out fabrication, placing and fixing of reinforcement for R.C.C structures 	
7.	<p>Work according to personal health, safety and environment protocol at</p> <p>Theory Duration (hh:mm) 02:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code CON/N9001</p>	<p>Theory:-</p> <ul style="list-style-type: none"> • Types of hazards involved in construction sites • Types of hazards involved in reinforcement works • Emergency safety control measures and actions to be taken under emergency situation • Identification of unsafe act and unsafe Condition • Concept of : <ul style="list-style-type: none"> ○ First Aid process ○ Use of fire extinguisher ○ Classification of fires and fire extinguisher ○ Safety drills ○ Types and use of PPEs required for reinforcement works ○ Reporting procedure to the concerned authority in emergency situations • Standard procedure of handling, storing and stacking material 	<p><u>PPEs</u></p> <ol style="list-style-type: none"> 1. Safety Helmet 2. Safety goggles 3. Safety shoes 4. Safety belt 5. Cotton gloves 6. Ear plugs 7. Reflective jackets 8. Dust mask 9. Fire Prevention kit

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		<p>Demonstration/ Practical :-</p> <ul style="list-style-type: none"> • The skills will be developed and practiced while carrying out following trade related activities in a predictable and familiar working condition. • Selection of PPEs and use them appropriately as per working need of reinforcement works, handling, storing, stacking and shifting of reinforcement material, tools and equipment • Selection of PPEs and use them appropriately as per working need of cutting, bending, placing and fixing of rebar • Identification of locations, situations/ circumstances, malpractices which can be hazardous for general or shuttering works 	
	<p>Total Duration 68:00 Hrs</p> <p>Theory Duration 12:00 Hrs</p> <p>Practical Duration 56:00 Hrs</p>	<p><u>Classroom Requirement</u></p> <ul style="list-style-type: none"> • Classroom of 30 students capacity, Black/White board, Projector/LED Monitor, Computer, Trade specific charts and other teaching accessories <p><u>Drawings/Sketches</u></p> <ul style="list-style-type: none"> • Drawings of various types of structures and structural elements, Bar bending schedule sample, Model room <p><u>Hand Tools</u></p> <ul style="list-style-type: none"> • Chisel, Hammer, Bar tying hook, Bending lever, Gauge measure, Podgier Spanner, Hack saw blade and frame <p><u>Measuring Instruments</u></p> <ul style="list-style-type: none"> • Steel scale, Try Scale, Spirit level, Plumb bob, Measurement tap <p><u>General requirement</u></p> <ul style="list-style-type: none"> • Reinforcement steel bar, Binding wires, Cover blocks, Wooden planks, Rebar tying machine, Lifting appliance (Sling, Shackle, Belts) M.S, TOR steel, TMT steel Binding wires, Steel cutting blade, Mechanical coupler, Cover blocks, Wooden planks, Rebar tying machine, Lifting appliance (Sling, Shackle, Belts) <p><u>PPEs</u></p> <ul style="list-style-type: none"> • Safety Helmet , Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs, Reflective jackets, Dust mask, Fire Prevention kit 	

Grand Total Course Duration: 68 Hours 0 Minutes