Assessment Guide – Bar bending & steel fixing L4

Sector: Construction

Occupation: Bar bending and fixing

Reference ID: CON/Q0203 ver. 1.0

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1. Qualification structure

To achieve full certification as a Bar Bender & Steel Fixer, trainees must complete all **six** units, attempt and pass assessments on practical skills, viva and written test.

Sl. no	Unit No.	Title	Assessment method
001	CON/N0204	Read and understand routine drawings / sketches and Bar Bending Schedule	The assessment for the practical skill part should be based on the competency of the trainee to correctly read and understand details provided in Drawing and BBS. Assessment of the knowledge part would be done by conducting written test and viva-voce
002	CON/N0205	Use hand and power tools for cutting and bending of reinforcement	The assessment for the practical skill part should be based on the competency of the trainee to use hand/ power tools for cutting and bending works. Assessment of the knowledge part would be done by conducting written test and viva-voce
003	CON/N0206	Prepare, fabricate, place and fix reinforcement for RCC structures	The assessment for the practical skill part should be based on the competency of the trainee to fabricate place and fix rebar for different RCC elements like slab, beam and column as per the drawings and BBS. Assessment of the knowledge part would be done by conducting written testand viva-voce
004	CON/N8001	Work effectively in a team to deliver desired results at the workplace	Assessment for the practical skill part should be based on the competency of the trainee to work effectively in a team including proper reporting, communication, , problem solving etc. Technical and professional knowledge should be judged on the basis of theory, viva-voice or through observation during the practical exercise.
005	CON/N8002	Plan and organize work to meet expected outcomes	Assessment of the practical skill of trainee would be based on the competency of effective planning and organizing for own work to meet expected outcomes. Assessment of the knowledge part would be done by conducting written test, viva-voce or through observation while carrying out

			practical exercise
006	CON/N9001	Work according to personal health, safety and environment protocol at construction site	Assessment for the practical skill part should be based on the competency of the trainee to demonstrate use of PPE, identify and report hazards, pollution control, and meet safety standards while performing the practical excersise. Assessment of the knowledge part would be done by conducting written test, viva-voce or through observation while carrying out practical exercise

2. Guidance for assessors

The qualification pack provides the performance criteria, skills and knowledge required to perform for the position of a Bar Bender & Steel Fixer at NSQF Level 4 in the Construction Sector. The role is referred to as 'Bar Bender & Steel Fixer'.

Brief Job Description: Bar bender & Steel Fixer is responsible for marking, cutting and bending of rebar's using hand or power tools effectively, fabricating, placing and fixing reinforcement at the desired location using correct ties within specified time and tolerance. The individual should have good knowledge of safe work practices and handling of rebar's properly.

Personal Attributes: The individual is expected to be physically fit and should be able to work across various locations in withstanding extreme conditions while working. The individual should be organized, diligent, methodical and able to implement and maintain safety practices. The individual should have independent ability to take quick decisions and have good communication skills and shall be able to work within a team to handle various bar bending tools and materials and work responsibly for own work within defined limit.

Introduction to assessments:
Trainees will be able to make an informed decision about their aptitude for work in this sector with an awareness of the options for career development.

The emphasis is on 'learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria. For this reason, trainees are required to complete a number of assignments to show their attainment of practical skills, viva and underpinning knowledge.

Overview of the assessments
The weightage of skill/performance assessment is 80% and for knowledge and understanding is 20% for each NOS.

The assessment consists of two categories:
1. Performance /Skill Assessment
2. Knowledge Assessment

Mode of Assessment
1. Demonstration/Practical for Performance /Skill Assessment
2. Synoptic multiple choice question test.
3. Viva

} For Knowledge Assessment

Grading and weightage for assessments
Trainees are graded Pass or Fail.
The passing percentage for this QP will be 70%. To pass the Qualification Pack, every trainee should also score a minimum of 70% individually in each NOS

Sl. no	Type of assessment	Sl. no
1.	Skill assessment by practical observation	**80**
2.	Knowledge assessment by synoptic MCQ test	**12**
3.	Knowledge assessment by viva	**8**

2.1 Performance/Skill Assessments

The performance/skill assessment will be conducted through demonstration/practical
Demonstration /Practical Assessment

There will be **Three** practical task for core NOS (i.e. CON/N0204 to CON/N0206) which the trainee must attempt and demonstrate the occupational skills acquired to pass. Also the practical skill for NOS – N8001, N8002 and N9001 would be judged while carrying out practical task for core NOSs. Practical assessment is externally set and externally marked.

Trainees must attempt and pass the practical test which is assessed through given tasks. The marking for the practical task is based upon the assessment sheets.

The practical task is of **5 hours** duration (per trainee).The trainee has to score **336 marks** to pass the practical test. The grading criteria are defined below.

Grading criteria for Performance/Skill Assessments

NOS	Title	Performance Assessment Duration (Minutes)	Min. passing marks out of 80	Assessment Result (Total Passing Marks)
CON/N0204	Read and understand routine drawings / sketches and Bar Bending Schedule	45	56	**336≥ Pass 336< Fail**
CON/N0205	Use hand and power tools for cutting and bending of reinforcement	45	56	
CON/N0206	Prepare, fabricate, place and fix reinforcement for RCC structures	180	56	
CON/N8001	Work effectively in a team to deliver desired results at the workplace	*	56	
CON/N8002	Plan and organize work to meet expected outcomes	*	56	
CON/N9001	Work according to personal health, safety and environment protocol at construction site	30	56	
Total		**5 hr**	**336/480**	

The assessment will be 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.

This assessment guide has a section for trainees-*Section 3*. For each assessment, the marking and grading criteria are intended only for faculty and assessors.
Scheduling of the practical task assessments is flexible but to retain integrity of the assessment, they should be carried out as closely as possible to the written assessments.

Trainees are **not** permitted to use the Performance criteria checklist to work when completing the practical tasks but may familiarise themselves with it prior to an assessment.

Introducing the practical assessment to trainees
It will be beneficial to take trainees through what is required in the practical assessments and the way in which each part will be graded. Trainees should have an opportunity to familiarise themselves with the way the tasks are graded.

Trainees may refer to their faculty for guidance on parts of the practical assignments only, though they should be aware that, especially for the practical assessments, the amount of guidance and support they are given may be reflected in the feedback and marks awarded.

2.2 Knowledge Assessment

The knowledge assessments are conducted through written test and viva.

1. Synoptic multiple choice question (MCQ) test

Synoptic test is an MCQ (Multiple Choice Question) test to assess the underpinning knowledge. The synoptic MCQ tests are externally set and externally marked. This test is to be taken by the trainee after completion of all the units under controlled and invigilated conditions as closed-book test under the supervision of an assessor. Trainees can only achieve whole marks; half marks for partially answered questions are not permitted. Selection of two or more options will be marked as wrong. The answers should to be marked by pen only.

Synoptic test is of **90 minutes** duration and carries **72 marks for 6 NOS**. 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.

2. Viva

Trainees are required to take the viva test **along with** their practical observation test which is an extended part of the knowledge assessment. Viva test is of **30 minutes** duration per learner and carry **48 Marks**. The viva assessments are externally set and externally marked. For further guidance on viva, assessors can refer to *Section 5*
The trainee has to score **84 marks** to pass the Knowledge assessment test.
The grading criteria is as defined below

Grading criteria for Knowledge assessment

NOS No.	Duration of Assessment (Minutes)	Knowledge Assessment		Min Passing marks	Assessment Result (Total Passing Marks
		MCQ test	Viva		
CON/N0204	120	12	8	14	**≥ 84-Pass < 84-Fail**
CON/N0205		12	8	14	
CON/N0206		12	8	14	
CON/N8001		12	8	14	
CON/N8002		12	8	14	
CON/N9001		12	8	14	
Total	**120**			**84/120**	

2.2 Question papers for synoptic test

The question paper of the synoptic test is a confidential document. It will be held under the custody of Assessment body. Every assessment body should prepare the question papers and get it approved from CSDCI.

2.3 Authenticity

Centres are reminded to check for authenticity of work where trainees may be using texts and the internet to complete exercise/ test.

2.4 Feedback

Assessors must provide feedback on every occasion when a skills observation takes place. (see *Section 4*).

2.5 Trainee records of coursework

Trainees should be encouraged to keep their work carefully in a portfolio or scrapbook. This may be an unfamiliar form of record keeping for some but it is a good discipline which will benefit them when they progress in their learning and training.

2.6 Recording sheets

Section 4 Assessments.

2.7 Codes of practice

Safe working practices, health and safety and codes of practice associated with the industry must always be adhered to.

2.8 Health and safety

The requirement to follow safe working practices is an integral part of all assessments and it is the responsibility of centres to ensure that all relevant health and safety requirements are in place before trainees start practical assessments.

Should a trainee fail to follow health and safety practice and procedures during an assessment, the assessment must be stopped and the trainee advised of the reasons why..

2.9 Verification of assignments

By using marking checklists, verifiers can check that evidence for an assignment is complete and can ensure that allocation of marks has been fair and beyond dispute.

2.10 Internal quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications.

Quality assurance includes initial centre approval, qualification approval and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and CSDCI and Assessment body are jointly responsible for external quality assurance.

Full details and guidance on the internal and external quality assurance requirements and procedures, are provided by CSDCI from time to time.

The Assessment bodies are required to retain copies of trainees' assessment records and photographic evidence (in presence of trainee performing task) for three years after assessment.

2.11 Evidence Collection by the Assessor

1. The assessor needs to collect a copy of the attendance for the training done. The attendance sheet needs to be signed by the Training Centre Head.
2. The centre head also needs to declare that all the students appearing in the assessments have a minimum attendance of 80% for the training.
3. The assessor needs to verify the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/ State Government. The same needs to be mentioned in the attendance sheet. Where ever required, the assessor can authenticate and cross verify trainee's credentials in the enrolment form.
4. The assessor needs to punch the trainee's roll number on all the final job pieces of learners. Different sections can have alpha numbering such as if a student's roll number is 123 then the three pieces submitted by that student can be numbered as 123a, 123b and 123c.
5. The assessor needs to take a group photograph of all the students along with the assessor standing in the middle and with the centre name/banner at the back, as evidence.
6. The assessor needs to carry a camera to click photographs of the trainees working on the job and giving theory exam as evidence.
7. The assessor also needs to carry a photo ID card.
8. Assessment Evidence Form (provided before the practical marks sheets –section 8), the assessor should place the final photographic evidence in the space provided as evidence, from appropriate angels/sides of the final job piece submitted.

3. Trainee guidance

3.1 Information for trainees

The assessment requires a trainee to perform a combination of tasks as given below:
The trainee will be required to:

- Demonstrate the occupational skills and competencies as mentioned in each NOS.
- Demonstrate knowledge and understanding skills as mentioned in each NOS.

Before the final assessments

The training partner (TP) will intimate that the trainees are ready for the assessment. The date and time of assessment would be intimated by CSDCI.

The trainee is required to reach the assessment venue at the scheduled date and time. TP is required to circulate the information regarding the assessment to the trainee. Failure to reach the assessment venue for the theory or the practical test as per the schedule would be considered absent. In exceptional cases, an assessor can give a maximum of half hour concession time for late coming.

The trainee is required to carry their Institutes photo ID card as well as a government issued photo ID card for verification on all days of assessments.

Any misbehaviour/unethical practice by a trainee would lead to disqualification of the trainee.

The assessment consists of two categories:

1. Knowledge/theory assessment
2. Performance /skill assessment

The first day of assessment will have the knowledge/theory test followed by practical and viva in smaller batches (20-30 trainee).

Assessment brief

Details of the two categories of assessments are mentioned below.

1. Theory (Synoptic multiple choice question)

Synoptic test is a Multiple Choice Question (MCQ) test to assess the underpinning knowledge and is to be taken by the trainee at the start of the assessment under controlled and invigilated conditions as a closed-book test.

The synoptic test c is of90 minutes duration.

2. Viva

Trainees are required to take the viva test along with their practical observation test which is an extended part of the knowledge assessment. Viva test is of maximum **30 minutes** duration per learner and carry 48 Marks.

A trainee has to score at least **84 marks** to pass the knowledge assessment.

Grading criteria for knowledge assessments

NOS No.	Duration of Assessment (Minutes)	Knowledge Assessment		Min Passing marks	Assessment Result (Total Passing Marks
		MCQ test	Viva		
CON/N0204	120	12	8	14	≥ 84-Pass < 84-Fail
CON/N0205		12	8	14	
CON/N0206		12	8	14	
CON/N8001		12	8	14	
CON/N8002		12	8	14	
CON/N9001		12	8	14	
Total	**120**			**84/120**	

3. Performance/skill assessments

Trainees will be briefed on the practical observation and checklist to familiarise them on observation methodology. The trainees would be assessed on their working as well as their final product. Trainees are suggested to read the Qualification Pack to familiarise on Performance Criteria, Knowledge, Understanding and Skills.

The practical task is for **5 hours.** A trainee has to score at least **336 marks** to pass the practical observation test.

Grading criteria for Performance/Skill Assessments

NOS	Title	Performance Assessment Duration (Minutes)	Min. passing marks out of 80	Assessment Result (Total Passing Marks)
CON/N0204	Read and understand routine drawings / sketches and Bar Bending Schedule	45	56	336≥ Pass 336< Fail
CON/N0205	Use hand and power tools for cutting and bending of reinforcement	45	56	
CON/N0206	Prepare, fabricate, place and fix reinforcement for RCC structures	180	56	
CON/N8001	Work effectively in a team to deliver desired results at the workplace	*	56	
CON/N8002	Plan and organize work to meet expected outcomes	*	56	
CON/N9001	Work according to personal health, safety and environment protocol at construction site	30	56	
Total		**5 hr**	**336/480**	

4. Assessments

Assessments for the job role of Bar Bender & Steel Fixer are conducted to gauge and assess the trainees' competencies and professional expertise as well as their skill and knowledge in the specified area (Bar Bending & Steel Fixing).

During the practical task, trainees will be 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. They will be graded for all their assessments based on the approved assessment strategy which is signed off by CSDCI.

The performance criteria checklist as a guide is given in section 5.0. Assessment tools in the form of a sample set of practical, theory and viva questions for each NOS of the QP is given as a guide in section 6 and 7.The assessment evidence, overall summary and NOS wise summary is given in section 8 to 10.

5. Performance criteria checklist

Bar Bender & Steel Fixer		
1. Learner Name: _____ **2. Enrolment No: _____ 3. Centre: _____**		
Guidance to assessors: **1. Assessor must exhibit the performance criteria checklist to the learners before the commencement of the practical and explain them how the learners will be observed and graded during the practical assessment. However the learners are not allowed to use this checklist during the course of the assessment or task.** **2. Assessor must ensure that all the tools listed in the "List of tools" are made available by the centre to every learner being assessed.**		
Practical	**Details**	**Marks**
CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule		
1	PC1. read and interpret basic detail from the sketches / drawings: • Read and understand rebar details from sketch/ drawings i.e. number of rebar, shape, cover, dimension, type and location of rebar etc.	
	PC2. understand fixing/insertion sequence from the drawings: • Describe the sequence of fixing steel for beam, slab, footing and column.	
	PC3. find out the direction and position of rebars from the drawing: • Mark rebar layout as per the drawing using red oxide on the floor.	
	PC4. calculate number of chairs, spacer bars requirement to be used: • Calculate the number of chairs required for slab reinforcement shown in the drawing • Calculate the number of spacer bar for beam reinforcement from the drawing.	
	PC5. find out the size and type of cover block to be used from the drawing: • Read cover details for rebar from drawings for given task (beam, column and slab). •	
	PC6. calculate cutting length required for basic works from the sketches: • Calculate cutting length of stirrups (circular and rectangle/square) using correct formula. • Calculate cutting length of rebar for chair. • Calculate the cutting length of stirrups for column, and beam with respect to the cover.	
	PC7. plan for cutting of rebar's as per instructions: • Arrange required tools and materials for cutting rebar basis on the diameter of rebar • Use hammer and chisel if the diameter 12 mm and below. • Use power tools (rebar cutter, rebar shearing machine) if the	

	diameter of bar is 16 mm and more.	
	PC8. read & interpret correct detail from Bar bending schedule including types, diameter, shape, cutting length, number of rebars: • List above rebar information's for beam, column and slab reinforcement	
	PC9. calculate the cutting length of rebar from the provided BBS: • Calculate the cutting length of rebar for beam reinforcement. • Calculate the cutting length for column and footing reinforcement. • Calculate the cutting length for slab reinforcement as per the drawing/BBS provided.	
	PC10. understand terms used in bar bending schedule: • Interpret the information's provided in the bar bending schedule • Define the terms mentioned in the BBS	
	PC11. estimate quantities of work from bar bending schedule: • Calculate the quantity of work for column and footing reinforcement. • Calculate the quantity of work for beam reinforcement. • Calculate the quantity of work for slab reinforcement.	
	PC12. plan for cutting of rebars as per instructions, considering minimum wastage and cutting length: • Arrange required tools for cutting rebar basis on the diameter of rebar • Use hammer and chisel if the diameter 12 mm and below. • Use power tools (rebar cutter, rebar shearing machine) if the diameter of bar is 16 mm and more. • Indentify the dia of rebars from drawing • Coordinate with site supervisor in order to know the requirement of cutting	
	Total Marks	**80**
CON/N0205: Use hand and power tools for cutting and bending of reinforcement		
2	PC1. select hand tools/power tools for cutting rebars as per requirement / Instruction: • Use hack saw, hammer and chisel if the diameter 12 mm and below. • Use power tools (rebar cutter, rebar shearing machine) if the diameter of bar is 16 mm and more. • Identify and demonstrate the use of hand held rebar cutting machine. • Identify and demonstrate the use of circular rebar cutting machine. • Identify and demonstrate the use of rebar shearing machine. • Follow proper ergonomic principles while using rebar cutting machine. • Ensure pre checks on machine and follow safety precautions while operating cutting machine and hand tools	

	PC2. select cutting blade for cutting of rebar as per requirement / instruction: • Selection of appropriate cutting blade based on the diameter of rebar • Observe if the blade is checked for cracks or damage	
	PC3. make use of measurement and marking tool to mark on rebars for cutting as per specified length in the BBS: • Compute, Measure and mark exact cutting length on the rebar using measurement tape and white chalk. • • Convert units from metric to imperial system	
	PC4. place rebars properly for cutting, as per requirement and instruction: • . • Placing of the rebar at marked location in a rebar cutting machine and hold firmly. • Demonstrate for manual and mechanical cutting • Follow ergonomic principles while placing rebar • Provide adequate support to rebars while cutting	
	PC5. ensure adequate number of rods are placed for cutting to avoid damage to machine: • • Observe the number of bars being cut at a time for various diameters	
	PC6. maintain correct body posture while cutting rebars manually or mechanically: • use of proper ergonomic principles while using rebar cutting machine. • Describe why loose clothing, long sleeves or jewellery should not be worn at site • Avoid wearing long sleeves • Observe if adequate distance from the moving parts in the machinery is maintained and operation is carried out carefully • observe if guards of machinery are in place and in working order • Demonstrate Use of required PPE's	
	PC7. tag and stack rebars after cutting as per standards practices: • Observe if Tagging and stacking rebar as per the location, shape, and sequence of fixing for column, beam, and slab is carried out • What are the standard practices for stacking the rebars • What are the details covered in tags	
	PC8. select hand/power tools for bending rebars with respect to the work: • Use of pin and plate if the diameter is16 mm and below. • Selection of appropriate lever and mandrels based on the diameter of rebar. • Use of power tools (rebar bending machine) if the diameter of bar is 20 mm and more.	
	PC9. select accessories for bending with respect to the diameter of rebar used & machine used: • Identify and use different types of bushes and other	

	accessories with respect to the diameter of rebar. • Selection of appropriate mandrels based on the diameter of rebar	
	PC10. mark on rebar and place & fix rods on correct position for bending: • Computation, Measurement and marking on the rebar using measurement tape and white chalk for bending. • rebar placed in the bending machine at required length or bending. • At what angle is the bar to be bent	
	PC11. maintain correct body posture while bending rebars manually or mechanically: • use of proper ergonomic principles while using rebar cutting machine. • Describe why loose clothing, long sleeves or jewellery should not be worn at site Observe if adequate distance from the moving parts in the machinery is maintained and operation is carried out carefully • observe if guards of machinery are in place and in working order Demonstrate Use of required PPE's	
	PC12. bend rebars as per the shape and dimensions given in the BBS, including hooks: • • Interpretation of details provided in the BBS • Identification of materials, tools and accessories required to carry out bending • Standard procedure to be followed while bending	
	PC13. check for length, shape of rebars to ensure they are within the tolerance limit: • Tolerance limits for reinforcement work for various structural units like, beams, columns, staircase, walls etc. • Trainee should check work performed by them for tolerance using standard procedure • Check column reinforcement with following tolerance limit • bar length (-)5mm /+3mm • Ring Size ±5mm • Ring spacing ±10 mm/5 spacing's • Footing bar length ±5mm • Footing bar spacing ±5mm • Cage Square ness ±5mm • Check beam reinforcement with following tolerance limit • Top bar length (-)5mm /+3mm • Bottom bar length (-)5mm /+3mm • Ring Size ±5mm • Ring spacing ±10 mm/5 spacing's • Cage Square ness ±5mm • Check slab reinforcement with following tolerance limit • Square ness of mat ±5 mm • Spacing of rebar ±10 mm/±5 spacing • Level of mat ±5mm • Length of slab ±5mm • Width of slab ±5mm • Diagonal of slab ±5mm	

	• Cut length of main /secondary bars ±5mm	
	PC14. tag and stack rebars after bending as per standard practices: • Observe if Tagging and stacking rebar as per the location, shape, and sequence of fixing for column, beam, and slab is carried out • What are the standard practices for stacking the rebars • What are the details covered in tags	
	Total Marks	**80**
CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures		
3	PC1. read & understand relevant specification given in the sketches/drawing: PC3. select rebars for placement as per the drawing: • • What are the specifications provided in drawings • On what basis is the rebars selected	
	PC2. follow correct method for insertion/ fixing of rebars as per the types of structure: PC4. mark and place rebars, fabricate cage and fix on its position as per the drawing: <u>For column and footing:</u> • Mark the dimension of footing Ensure cover from all four sides. • Mark spacing • Mark the dimension (overall) of column on PCC. • Mark main rebar by ensuring cover from all sides. • Mark stirrup spacing () on all main bars. • <u>For Beam:</u> • Mark centre to centre (stirrup spacing) on top rebar. • Mark on bottom layer with respect to the top reinforcement. <u>For slab:</u> • Mark in X axis for bottom layer. • Mark in Y axis for bottom layer. • Mark location of chair on bottom layer	
	PC5. maintain uniform spacing between the bars, stirrups, link rod as per the drawing: <u>For column:</u> • Ensure cover for footing • Ensure spacing on either directions • Ensure cover to main rebar from all four sides. • Ensure uniform spacing for stirrup throughout the height of column. <u>For Beam:</u> • Ensure cover from all four sides. • Ensure uniform spacing on centre of the beam. <u>For slab:</u> • Place alternate bars and adjust bottom layer in X axis to maintain uniform spacing throughout the length (250mm centre to centre). • Place alternate bars and adjust bottom layer in Y axis to	

	maintain uniform spacing throughout the length (275mm centre to centre). • Ensure that the intersection of rebar in two direction should be in 90 degree.	
	PC6. stagger the lap to avoid more than 50% of splicing: <u>For column:</u> • Lap main bars in different lapping zone (within L/3) to stagger the lap to avoid more than 50% of splicing (Assessor to instruct candidate to use cut length rebar to perform this step). <u>For Beam:</u> • Lap main bars in different lapping zone (within L/3) to stagger the lap to avoid more than 50% of splicing (Assessor to instruct candidate to use cut length rebar to perform this step). <u>For slab:</u> • Stagger the lap to avoid more than 50% of splicing at a single lapping zone (Assessor to instruct candidate to use cut length rebar to perform this step).	
	PC7. place and fix mechanical coupler in case of higher diameter rebars used: • Assessor to ask viva questions to assess the knowledge.	
	PC8. tie reinforcement with approved binding wires as per drawing with specified spacing: <u>For column:</u> • Select black annealed 17 gauge binding wire to tie rebar. • Tie stirrups using crown, hairpin and ring hairpin tie. • Lap rebar using splice tie. <u>For Beam:</u> • Select black annealed 17 gauge binding wire to tie rebar. • Tie stirrups using crown, hairpin and ring hairpin tie. • Lap rebar using splice tie. <u>For slab:</u> • Select black annealed 17 gauge binding wire to tie rebar. • Tie bottom layer using ring slash tie. • Lap rebar using splice tie.	
	PC10. place and fix chairs at specified spacing to maintain correct thickness: <u>For Slab:</u> • Fabricate chair bar by considering slab thickness 180mm (deduct diameter of rebar used in top and bottom layer). • Ensure 20mm cover for top and bottom layer of slab reinforcement. • Place and tie chair bars to bottom and top layer (4 numbers).	
	PC12. follow sequence of tying as per method statement: <u>For column:</u> • Mark footing dimension and rebar spacing • Place and tie footing mat using crown tie • Mark column dimension and rebar. • Place main bars and support it from all four sides. (use vertical prop to support) • Mark spacing on corner bar (main bar).	

	• Insert and tie stirrups as per the marking. • Lap main rod at lapping zone and tie stirrups. <u>For Beam:</u> • Place/hang top reinforcement using vertical support. • Mark spacing on top reinforcement. • Insert required number of stirrups. • Tie stirrups to top layer as per the marking. • Insert bottom rebar's from one end. • Adjust the position of bottom bar and tie stirrups to the bottom layer. • Place and tie spacer bar on bottom layer. • Place second layer of bottom bar over the spacer bar and tie the stirrups. <u>For slab:</u> • Place and tie corner bar first and mark spacing on same. • Check spacing and angle between bars. • Place and tie cover blocks.	

	PC11. ensure that location and position of reinforcement and fixing ties to reinforcement are checked for accuracy:
	PC14. check quality of reinforcement work with reference to spacing, placement of rebars:
	• Check column reinforcement with following tolerance limit
	  • Column bar length (-)5mm /+3mm
	  • Ring Size ±5mm
	  • Ring spacing ±10 mm/5 spacing's
	  • Footing bar length ±5mm
	  • Footing bar spacing ±5mm
	  • Cage Square ness ±5mm
	• Check beam reinforcement with following tolerance limit
	  • Top bar length (-)5mm /+3mm
	  • Bottom bar length (-)5mm /+3mm
	  • Ring Size ±5mm
	  • Ring spacing ±10 mm/5 spacing's
	  • Cage Square ness ±5mm
	• Check slab reinforcement with following tolerance limit
	  • Spacing of rebar ±10 mm/±5 spacing
	  • Length of slab ±5mm
	  • Width of slab ±5mm
	  •	

	PC15. report to superior for checking of work executed and take corrective action if any error or issue is found: • Hand over the completed task to the assessor/instructor.	
	Total Marks	**80**
CON/N8001: Work effectively in a team to deliver desired results at the workplace		
6	PC1. Pass on work related information/ requirement clearly to the team members: • Communicate work related information clearly to the team members while performing task. Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement	

	• CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC2. Inform co-workers and superiors about any kind of deviations from work: • Inform any kind of deviation to the instructor while performing the task. • What is deviation from work • Reporting procedure to convey information to seniors • Modes of communication for transferring information to coworkers Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC3. Address the problems effectively and if required, report to immediate supervisor appropriately: • Address the problems related to damaged or unguarded machineries, damaged electrical cables, material shortage, drawings etc Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC4. receive instructions clearly from superiors and respond effectively on same: • Adhere to the instructions given by assessor/instructor while performing the task. • Is able to receive instructions clearly. Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC5. Communicate to team members/subordinates for appropriate work technique and method: • Communicate work related information/techniques clearly to the team members while performing task Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement	

	• CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC6. Seek clarification and advice as per requirement and applicability: • Is able to seek clarification and advice as per requirement. Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC7. Hand over the required material, tools, tackles, equipment and work fronts timely to interfacing teams: • Hand over the required tools/ materials to appropriate person post completion of work • Collect required tools/ devices from stores/ respective departments/ authority prior to start working • Complete tasks within provided time limit • Ensure material/ tools/ tackles are handed over to interfacing teams in safe condition Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC8. Work together with co-workers in a synchronized manner: • Work together with co-worker. Have clear communication with the team member while performing the task. • Help and motivate co-workers to complete the task. • Advice team member on work techniques. • Report conflict to superior/ concerned authority Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	Total Marks	**80**
CON/N8002: Plan and organize work to meet expected outcomes		
7	PC1. Understand clearly the targets and timelines set by superiors: • Interpret the instructions from seniors. • Describe duration of tasks to be performed to the assessor Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and	

	bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC2. Plan activities as per schedule and sequence: • Describe steps to be followed to execute assign task • Follow the sequence of work. Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC3. Provide guidance to the subordinates to obtain desired outcome PC8. Engage allocated manpower in an appropriate manner: • Describe the use of tools to subordinates • Provide work to subordinate based upon their capabilities and attributes Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC4. Plan housekeeping activities prior to and post completion of work: • Implement housekeeping norms and instructions • Identify the need of housekeeping • Describe the activities covered in housekeeping • Describe the importance of housekeeping before and after work Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC5. List and arrange required resources prior to commencement of work PC6. Select and employ correct tools, tackles and equipment for completion of desired work PC7. Complete the work with allocated resources • Identify & list the resources required for relevant task • Acquire tools/ materials from authorised place/ person. • Describe required tools/ materials for assigned tasks. • Use tools and materials to execute tasks Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement	

	for RCC structures	
	PC9. Use resources in an optimum manner to avoid any unnecessary wastage PC10. Employ tools, tackles and equipment with care to avoid damage to the same • Is able to reduce material damage/wateage while performing task. • Is able to follow proper sequence of execution. • Is able to select right tool for right job. • Is able to safeguard the tools and equipment while performing the task. Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC11. Organize work output, materials used, tools and tackles deployed PC12. Processes adopted to be in line with the specified standards and instructions • Is able to list and organise the material, tools and tackles used. • Is able to follow standard procedures while performing the task. • Is able to follow safe working practices while performing the task Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	Total Marks	**80**
CON/N9001: Work according to personal health, safety and environment protocol at construction site		
8	PC1. Identify and report any hazard, risks or breaches in site safety to the appropriate authority PC6. Use appropriate Personal Protective Equipment (PPE) as per work requirements including: Is able to identify and demonstrate the use of following PPE: • Head Protection (Helmets) • Ear protection. • Fall Protection. • Foot Protection. • Face and Eye Protection. • Hand and Body Protection.	

	• Respiratory Protection (if required). ***The skill is mandatory to be exhibited by assesse to pass the NOS** • Describe the use & importance of PPE • List possible hazards while performing different task (Bending and steel fixing, scaffold erection) • Identify work place hazards while executing the task (damaged cable, damaged tools). Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	PC2. Follow emergency and evacuation procedures in case of accidents, fires, natural calamities • List different types of emergency situation (Fire, flood, building collapse, war etc.) • describe proper method to respond in case of any emergency. (Candidate to perform role play based on the scenario given by assessor)	
	PC3. Follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable • Follow safe working practice while performing all the task. • Follow safe practice while handling hand and power tools.	
	PC4. Participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site • List different types of emergency situation (Fire, flood, building collapse, war etc.) • Ensure proper method to respond in case of any emergency. (Assessor to ask viva questions to assess the knowledge) • Name different safety awareness program. • List the benefits of attending safety awareness program.	
	PC5. Identify near miss, unsafe condition and unsafe act • List unsafe condition found while performing the task (Lack of illumination, inadequate ventilation, overcrowded and congested work places, unguarded and faulty machineries, defective tools and equipment etc.) • List unsafe act found while performing the task (Not wearing safety gadgets, bullying team member, using faulty machineries etc.).	
	PC7. Handle all required tools, tackles, materials & equipment safely. • Follow safe practice while handling hand tools, power tools and materials Assessor may observe this skill while following tasks are being performed by assesse • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	

	PC8. Follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines • Follow safe disposal of harmful waste. • Follow proper precautionary measures while handling harmful waste (waste shuttering oil, chemical etc.) • Dispose hazardous waste into designated container.	
	PC9. Install and apply properly all safety equipment as instructed • Identify and demonstrate the use of air breathing equipment. • Identify and demonstrate the use of fire extinguisher. • Identify and demonstrate the use of fire blanket.	
	PC10. Follow safety protocol and practices as laid down by site EHS department. • Identify and list the information provided in emergency preparedness plan. • Describe safe assembly point. • List emergency services with contact number (Fire, ambulance etc.). • List the components of first aid box. • Describe first aid procedure for different accidents. • List hygienic practice to be followed.	
	PC11. Collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes • Collect the waste into designated yard or container based on the type of waste (waste binding wire, metal dust found while cutting operation, waste rebar, concrete waste, organic waste etc.). • Follow correct method to shift waste materials to the designated yard (chute system, wheel barrow, mortar pan, tractor etc.)	
	PC12. Apply ergonomic principles wherever required. • Follow proper ergonomic principles while performing all the task (While rebar cutting, bending, placing and fixing) Assessor may observe this skill while following tasks are being performed by assesse • CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule • CON/N0205: Use hand and power tools for cutting and bending of reinforcement • CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	
	Total Marks	**80**
	Grand Total	**480**

6. Tools, materials and consumable list

Below tools list is prepared based on the practical questions for the NOS CON/N0204, CON/N0205, and CON/N0206.

Calculators

Quantity for 1 batch of trainees

Tools and consumables required				
Category	**Sl.no.**	**Particulars**	**Specification**	**Quantity**
Tools	1.	Chisel	Flat toughened	4 sets
	2.	Hammer	5 Lb, 7 Lb, 10 Lb	4 sets
	3.	Bar tying hook	8mm (tor steel) with wooden handle	4 sets
	4.	Bending lever, 12mm, 16mm, 20mm	Two headed (Iron)	4 sets
	5.	Line string (line dori)	2mm Nylon string	4 sets
	6.	Gauge measure (SWG)	MS gauge box	4 sets
	7.	Podger spanner	17mm-19mm	4 sets
	8.	Hack saw blade with frame	Type B	4 sets
Measuring instruments	1.	Steel scale	30 cm	25
	2.	Try square	150 X150 mm	15
	3.	Spirit level	3 meter	02
	4.	Plumb bob	Brass (150 gram)	04
	5.	Measuring tape	5 meter	4 sets
Power tools	1.	Rebar cutting machine	Any reputed brand	2 sets
	2.	Rebar shearing machine	Any reputed brand	2 sets
	3.	Rebar bending machine	Any reputed brand	2 sets
	4.			
	5.	Rebar tying machine	Any reputed brand	2 sets
Materials required for practical	1.	8 mm rebar	Fe-500	320kg
	2.	12 mm rebar	Fe-500	80kg
	3.	16 mm rebar	Fe-500	400 kg
	4.	10mm, 20mm, 25mm, 32mm (1 meter sample pieces)	Tor steel	5
	5.	Binding wires (black annealed)	19 gauge	5 kg
	6.	PVC cover block	20, 25, 40, 50mm	50
	7.	Cup lock scaffold (Including all the components)	Any reputed brand	05 set
	8.	Wooden planks	350 X 50 mm	As required
	9.	Lifting appliances (wheel and rope, shackles, sling, belts)	Any reputed brand	2 sets
	10.	Wheel barrows	100 kg capacity	4
	11.	Wooden sleepers	350 X 350	4 set
	12.	White chalk	Any reputed brand	4 box
	13.	Red oxide	Any reputed brand	1 litre

Consumables	1.	Helmet	Any reputed brand	1 per learner
	2.	Face shield	Any reputed brand	1 per learner
	3.	Safety goggles	Any reputed brand	1 per learner
	4.	Safety shoes	Any reputed brand	1 per learner
	5.	Safety belt	Any reputed brand	1 per learner
	6.	Ear defenders	Any reputed brand	1 per learner
	7.	Particle masks	Any reputed brand	1 per learner
	8.	Overalls	Any reputed brand	1 per learner
	9.	Knee pad	Any reputed brand	1 per learner
	10.	Reflective jackets	Any reputed brand	1 per learner
	11.	Pencil	Any reputed brand	1 per learner
Infrastructure	1.	Class room for theory assessment with 30 study chairs	300 sq.ft	1 per batch
	2.	Workshop for practical assessment	900 sq.ft	1 per batch
	3.	Toilet/Urinals (Separate for gents and Ladies)	2 WC +5 urinals	1 per batch
	4.	3 phase power supply points	Any reputed brand	As required
	5.	Single phase power supply points	Any reputed brand	As required
	6.	Fire extinguishers (mechanical foam, DCP, CO_2 and sand buckets with stand)	Any reputed brand	As required
	7.	First aid kit	Any reputed brand	As required
	8.	Tool box with lock and key	Any reputed brand	As required

7. Assessment methods/tools

7.1 CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule

A. Practical questions **Total Marks: 80**

Duration: 45 minutes

Note: This task is the preparatory part for the practical task of NOS N0205 and N0206, hence each activities should be interlinked with the main task (N0206). Candidate to refer the drawing and BBS attached in N0206 while performing the below activities.

Candidate should able to:

1. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for footing and column reinforcement 8 Marks
   - List the details of rebar diameter, type, shape, spacing, cover and location as per the drawing and BBS provided in NOS N0206
2. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for beam reinforcement 8 Marks
   - List the details of rebar diameter, type, shape, spacing, cover and location as per the drawing and BBS provided in NOS N0206
3. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for slab reinforcement 8 Marks
   - List the details of rebar diameter, type, shape, spacing, cover and location as per the drawing and BBS provided in NOS N0206
4. Calculate number of chairs, spacer bars requirement to be used 10 Marks
   - Calculate the number of chairs, diameter, shape and height required for slab reinforcement (from the given task)
   - Calculate the number of spacer bars, diameter and spacing required for beam reinforcement (from the given task)
5. Calculate cutting length required for column and footing reinforcement work from the sketches and bar bending schedule provided 12 marks
   - Calculate the cutting length for rebar code FB-1, FB-2, BT-1 and CS-1 as shown in the drawing (column and footing drawing attached in NOS N0206).
6. Calculate cutting length required for beam reinforcement works from the sketches and bar bending schedule provided 12 marks
   - Calculate the cutting length for rebar code BB-1, BB-2, BT-1 and BS 1 as shown in the drawing (beam drawing attached in NOS N0206).
7. Calculate cutting length required for two way slab reinforcement works from the sketches and bar bending schedule provided 12 marks
   - Calculate the cutting length for rebar code SM-1, SM-2, SM-3 and SM-4 as shown in the drawing (slab drawing attached in NOS N0206).
8. Estimate quantities of work from bar bending schedule 10 marks
   - Estimate the quantity of work from bar bending schedule provided for footing, column, beam and two way slab (BBS attached in NOS N0206).

B. Multiple choice questions **Total Marks: 12**

Duration: 15 Minutes

(Preferably written but oral is also permitted)

1. What is the meaning of rebar statement “4 - 16ø @ 250 c/c”? 1 Mark
   a. 16 numbers of 4 mm diameter rebar at a spacing of 250 mm centre to centre
   b. 4 numbers of 16 mm diameter rebar at a spacing of 250 mm centre to centre
   c. 25 numbers of 16 mm diameter rebar at a spacing of 4 mm centre to centre
   d. 4 numbers of 16 mm diameter rebar at a spacing of 250 mm centre to centre

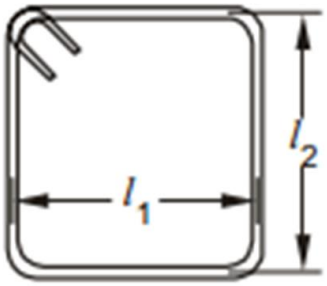
2. What is the function of spacer bar? 1 Mark
   a. To provide gap between concrete edge and the rebar
   b. To provide gap between rebar chairs
   c. To provide gap between double layer rebar
   d. To provide gap between stirrups

3. Which one of the following is the purpose of using chair bars in slab reinforcement? 2 Marks
   a. **To maintain correct level and thickness of rebar layers**
   b. To use as shear reinforcement
   c. To use as shear key’s for cold joint.
   d. To increase the quantity of reinforcement

4. Which of the following is the ideal size of cover block for footings? 2 Marks
   a. 40 mm
   b. **50 mm**
   c. 10 mm
   d. 20 mm

5. Which of the following is the ideal hook length for stirrups? 2 Marks
   a. 75 mm
   b. 50 mm
   c. 20 mm
   d. **150 mm**

6. What is the total length of the below shown rebar shape? 2 Marks



   a. **[2(l1 + l2) + 24 D]**
   b. [2(l1 + l2) + 24 D]2
   c. 2 X l1 + l2 + 24 D
   d. [2(l2) + 24 D+l1]

7. What is the unit weight of 16 mm,8mm and 32 mm resp. diameter steel rebar? 2 Marks

a. 0.98 kg/meter
b. **1.58 kg/meter**
c. 1.58 kg/mm
d. 2,47 kg/meter

Add questions relating to

1. Conversion of units
2. Details covered in drawing and bbs

3. C. Viva questions **Total Marks: 08**
Duration: 5 Minutes

(These questions could be asked during practical observation)

1. State the use of different types of tie? 2 Marks

Possible answers

a. Slash tie – used for footing, wall and slab
b. Crown tie – used for column and beam
c. Hair pin tie – used for column and beam
d. Ring hair pin tie – used for column and beam
e. Ring slash tie – used for footing, wall and slab
f. Splice tie – used for rebar lapping

2. What are the common cover ensured for different RCC elements? 2 Marks

Possible answers

a. For beam – 20 to 25 mm
b. For slab – 15 to 20 mm
c. For column – 40 mm
d. For footings – 50 mm
e. For RCC wall – 20 to 25 mm

3. What are the information's provided in the bar bending schedule? 2 Marks

Possible answers:

a. Location
b. Bar mark
c. Diameter of the bar
d. Number of bar
e. Cutting length of one bar
f. Total cutting length
g. Total weight of the bar
h. Bar shape

4. What are the unit weight for different diameter rebar? 2 Marks

Possible answers:

a. 6 mm – 0.222 kg/meter
b. 8 mm - 0.395 kg/meter
c. 10 mm - 0.617 kg/meter
d. 12 mm - 0.888 kg/meter
e. 16 mm – 1.58 kg/meter
f. 20 mm – 2.47 kg/meter
g. 25 mm – 3.85 kg/meter
h. 32 mm – 6.31 kg/meter

add questions relating to
prevention of steel from rusting
what are different measuring tools and applications

7.2 CON/N0205: Use hand and power tools for cutting and bending of reinforcement

A. Practical questions **Total Marks: 80**
Duration: 45 minutes

Note: This task is the extended part of NOS N0204 and preparatory part for the practical task of NOS N0206, hence each activities should be interlinked with the main task (N0206). Candidate to refer the drawing and bar bending schedule attached in N0206 while performing the below activities.

Candidate should able to:

9. Select appropriate hand and power tools for cutting rebars as per rebar code for footing, column, beam and two way slab. 5 Marks
    - Candidate to select hand tool if the diameter of the rebar 12 mm and below (i.e. hack saw blade, hammer and chisel).
    - Select power tool if the diameter of rebar 16 mm and above (i.e. rebar shearing machine, rebar cutter etc.).
10. Mark and cut cutting length as per the dimension from the given bar bending schedule for footing and column reinforcement. 8 marks
    - Candidate to mark and cut rebar as per the rebar code FB-1, FB-2, BT-1 and CS 1 as shown in the bar bending schedule (attached in NOS N0206).
11. Mark and cut cutting length as per the dimension from the given bar bending schedule for beam reinforcement. 8 marks
    - Candidate to mark and cut rebar as per the rebar code BB-1, BB-2, BT-1 and BS 1 as shown in the bar bending schedule (attached in NOS N0206).
12. Mark and cut cutting length as per the dimension from the given bar bending schedule for two way slab reinforcement. 8 marks
    - Candidate to mark and cut rebar as per the rebar code SM-1, SM-2, SM-3 and SM-4 as shown in the bar bending schedule (attached in NOS N0206).
13. Follow safe operating practices while using hand and power tools for cutting. 8 Marks
    - Candidate to maintain correct body posture while cutting rebars manually or mechanically
    - Ensure adequate number of rods are placed for cutting to avoid damage to machine
    - Place and hold rebars firmly.
    - Select appropriate cutting blade for cutting of rebar.
14. Bend rebar as per the shape and dimension from the given bar bending schedule for footing and column reinforcement. 10 Marks
    - Candidate to mark and bend rebar as per the rebar code FB-1, FB-2, BT-1 and CS 1 as shown in the bar bending schedule (attached in NOS N0206).
15. Bend rebar as per the shape and dimension from the given bar bending schedule for beam reinforcement. 10 Marks
    - Candidate to mark and bend rebar as per the rebar code BB-1, BB-2, BT-1 and BS 1 as shown in the bar bending schedule (attached in NOS N0206).
16. Bend rebar as per the shape and dimension from the given bar bending schedule for two way slab reinforcement. 10 Marks
    - Candidate to mark and bend rebar as per the rebar code SM-1, SM-2, SM-3 and SM-4 as shown in the bar bending schedule (attached in NOS N0206).
17. Follow safe operating practices while using hand and power tools for bending. 8 Marks
    - Candidate to place & fix rods on correct position for bending
    - Maintain correct body posture while bending rebars manually or mechanically
    - Select accessories for bending with respect to the diameter of rebar used & machine used
    - Select cutting blade for cutting of rebar as per the requirement
18. Tag and stack rebars after cutting and bending as per standard practices 5 Marks

- Candidate to stack rebar after cutting and bending as per the rebar code and sequence of fixing.

(All tasks should be considered accepted only on completion of task within acceptable tolerance limit. Also keep in view that **completion of given task within permissible tolerance limit** will be awarded full marks otherwise zero. Accepted tolerance limit for this task is attached in annexure 2 and also mentioned in respective assessment sheet)

B. Multiple choice questions **Total Marks: 12**

Duration: 15 Minutes

(Preferably written but oral is also permitted)

1. Identify the power tool shown below. 1 Mark

a. Bar bending machine
b. Bar threading machine
c. **Bar shearing machine**
d. Bar straightening machine

2. Which of the following is the common material used to mark the measurements in rebar? 2 Marks

a. Ball pen
b. Hack saw blade
c. Paint and brush
d. **White chalk**

3. What is the maximum number of 32 diameter rebar's can be cut in a rebar shearing machine at a time. 2 Marks

a. **Two**
b. Four
c. Five
d. Six

4. What is the basic purpose of tagging rebar after bending in required shape? 1 Mark

a. **To identify the location of fixing**
b. To calculate the quantity of work done
c. To maintain site tidiness
d. To safe guard the material from rain water

5. Which of the following is the ideal diameter of spandrel to bend 25 mm diameter rebar? 2 Marks

a. 25 mm
b. **100 mm**
c. 200 mm
d. 50 mm

6. What is the unit weight of steel? 2 Mark

a. 8750 kg/m^3
b. 8570 kg/m^3
c. **7850 kg/m^3**
d. 5780 kg/m^3

7. What is the allowable tolerance limit for diagonal measurement of a stirrup? 2 Marks

a. +/-15mm
b. +/-12mm

c. **+/-5mm**
d. +/-10 mm
add more questions on tolerance

C. Viva questions **Total Marks: 8**
Duration: 5 Minutes

(These questions could be asked during practical observation)

1. What are the common hand and power tools used to cut rebar and identify the same on site? 2 Marks
   Possible answers:
   a. Chisel and hammer
   b. Hacksaw blade
   c. Rebar cutting machine
   d. Rebar shearing machine
   e. Rebar grinding machine

2. What are the safety precautions to be taken while operating rebar cutting machine**?** 3 Marks
   Possible answers:
   a. Operate the tool after getting properly trained
   b. Do not wear loose clothing or jewellery
   c. Avoid wearing long sleeves
   d. Keep distance from the moving parts in the machinery and operate carefully
   e. Ensure guards are in place and in working order
   f. Use required PPE's
   g. Do not overload the tool above the specified limit
   h. Check the tool and its cord for good condition before using
   i. Always use the handle provided on the tool to carry the tool

3. What is the tolerance limit for slab reinforcement? 3 Marks
   Possible answers:
   a. Spacing of rebar ±10 mm (for 5 spacing/rebar)
   b. Level of mat (planeness) ±5mm
   c. Length of slab ±5mm
   d. Width of slab ±5mm
   e. Diagonal of slab ±5mm
   f. Cut length of main /secondary bars ±5mm

   add
   what is CNC machine & its applications
   what is optimisation of resources

7.3 CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures

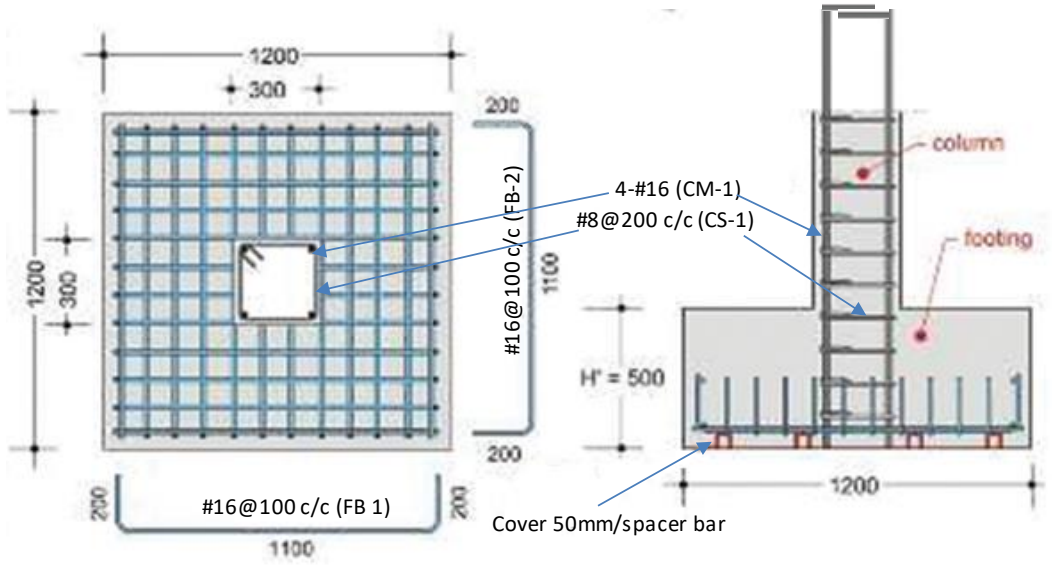
A. Practical questions **Total Marks: 80**
Duration: 180 minutes (60 Minute for each practical)

- Follow correct method for insertion/ fixing of rebars for footing and column reinforcement 20 Marks
  - Candidate to mark the reinforcement layout as per the drawing.
  - Place the rebar as per the rebar code mentioned in the drawing.
  - Maintain uniform spacing as mentioned in the drawing.
  - Tie rebar using appropriate tie as per the standard practices.
  - Place and fix cover blocks as per the requirement.
  - Follow the sequence as per the method statement
- Follow correct method for insertion/ fixing of rebars for beam reinforcement 20 Marks
  - Candidate to mark the reinforcement layout as per the drawing.
  - Place the rebar as per the rebar code mentioned in the drawing.
  - Maintain uniform spacing as mentioned in the drawing.
  - Tie rebar using appropriate tie as per the standard practices.
  - Place and fix cover blocks as per the requirement.
  - Follow the sequence as per the method statement
- Follow correct method for insertion/ fixing of rebars for slab reinforcement 20 Marks
  - Candidate to mark the reinforcement layout as per the drawing.
  - Place the rebar as per the rebar code mentioned in the drawing.
  - Maintain uniform spacing as mentioned in the drawing.
  - Tie rebar using appropriate tie as per the standard practices.
  - Place and fix cover blocks as per the requirement.
  - Follow the sequence as per the method statement
- Check quality of reinforcement work with reference to spacing, placement of rebars 10 marks
  - Candidate to check the reinforcement work with respect to the dimension, spacing, alignment, verticality using required tools.

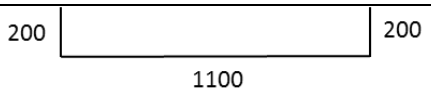
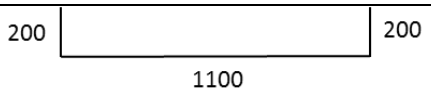
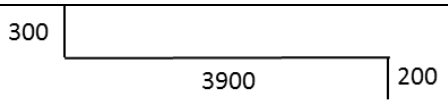
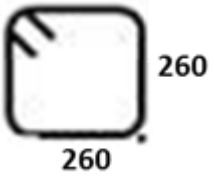
  (All tasks should be considered accepted only on completion of task within acceptable tolerance limit. Also keep in view that **completion of given task within permissible tolerance limit** will be awarded full marks otherwise zero. Accepted tolerance limit for this task is attached in annexure 3 and also mentioned in respective assessment sheet)

A. Fabricate, place and fix rebar for column and footing as per the drawing

Add lapping arrangement drawings and show the details of the same in BBS



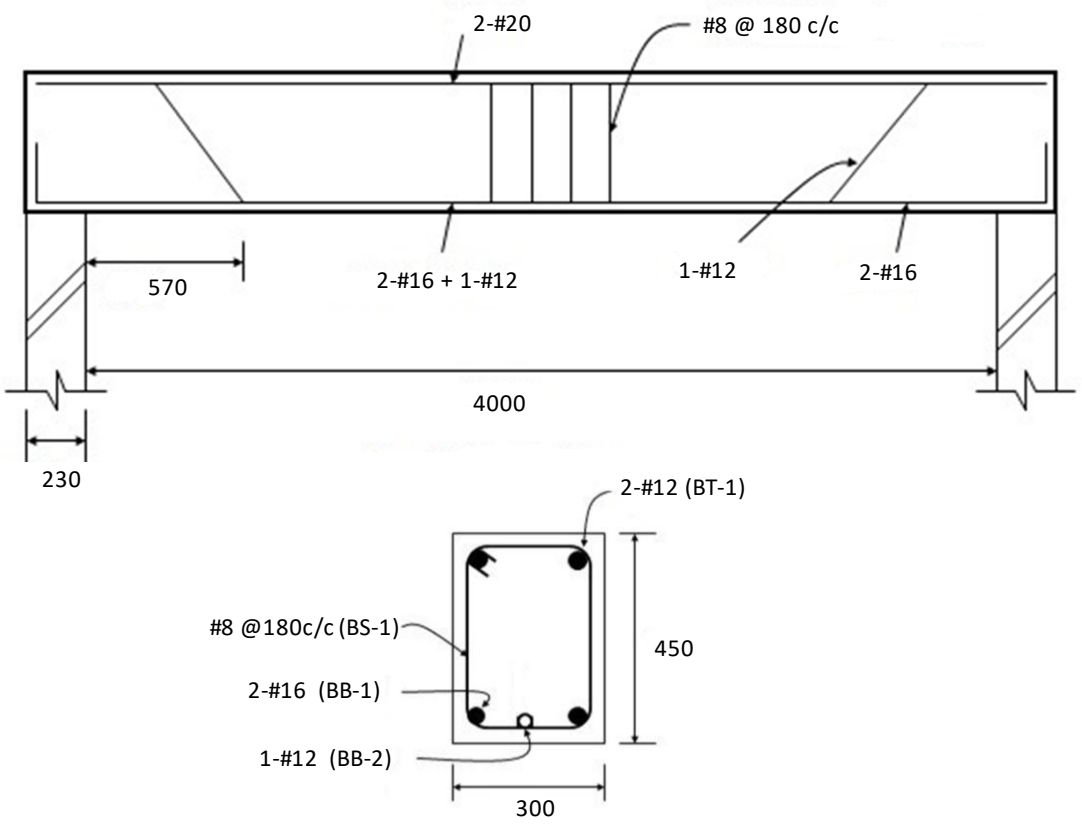
Title:	Fabricate, place and fix rebar for footing and column using appropriate ties
Material:	16mm, 8mm Fe-500
Scale:	Not to scale
Unit:	All dimensions are in mm
Cover:	For footing 50mm, for column 40mm

Bar bending schedule for Beam						
No	**Bar mark**	**Bar dia (mm)**	**No. of bars**	**Length (mm)**	**Weight of bars (kg)**	**Bar shape**
1	FB1	16	11	1436	24.96	
2	FB2	16	11	1436	24.96	
3	CM1	16	4	4336	27.40	
4	CS1	8	20	1232	9.73	

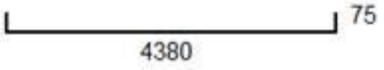
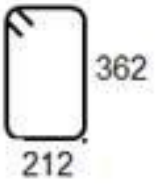
Note: This task can be modified without deviating the performance criteria. Helper to be provided to perform the task.

B. Fabricate, place and fix rebar for beam as per the drawing

Add lapping arrangement drawings and show the details of the same in BBS
Make provisions for tying spacers



Title:	Fabricate, place and fix rebar for beam using appropriate ties
Material:	16mm, 12mm, 8mm Fe-500
Scale:	Not to scale
Unit:	All dimensions are in mm
Beam Cover:	25mm

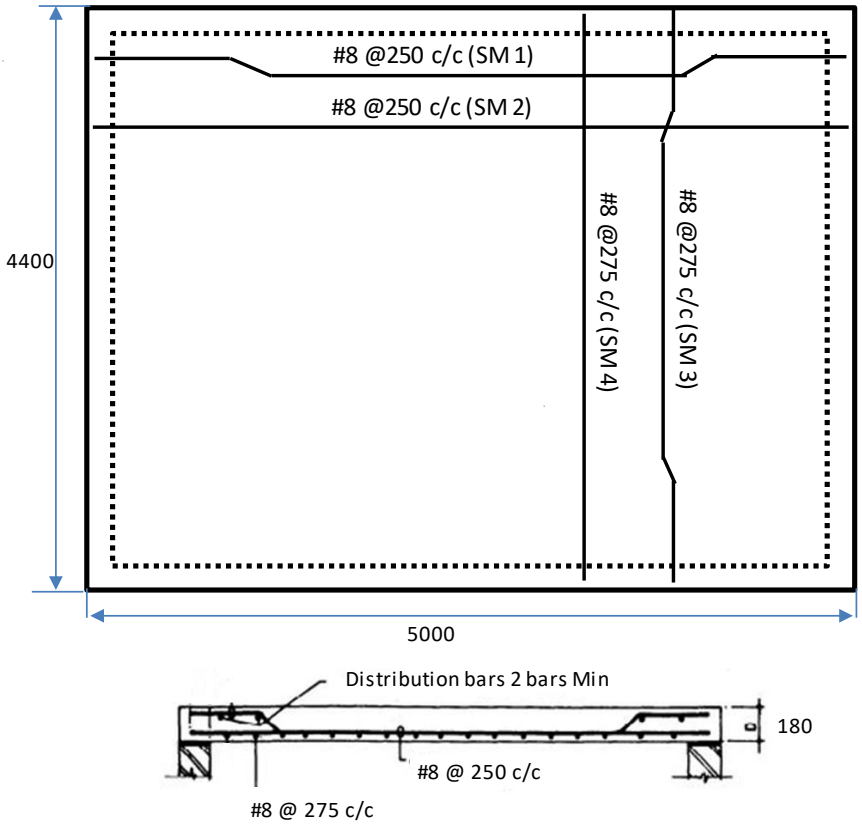
Bar bending schedule for Beam						
No	**Bar mark**	**Bar dia (mm)**	**No. of bars**	**Length (mm)**	**Weight of bars (kg)**	**Bar shape**
1	BB1	16	2	4580	14.5	
2	BB2	12	1	4520	4.02	
3	BT1	12	2	4380	7.8	
4	BS1	8	24	1330	12.6	

Note: This task can be modified without deviating the performance criteria. Helper to be provided to perform the task.

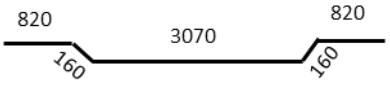
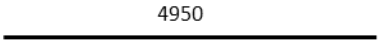
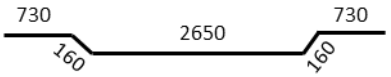
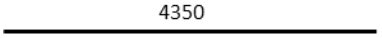
C. Fabricate, place and fix rebar for two way slab as per the drawing

Add lap arrangement drawing and show the details of the same in BBS

Insert chairs



Title:	Fabricate, place and fix rebar for two way slab
Material:	8mm Fe-500
Scale:	Not to scale
Unit:	All dimensions are in mm
Cover:	20 mm

Bar bending schedule for slab						
No	**Bar mark**	**Bar dia (mm)**	**No. of bars**	**Length (mm)**	**Weight of bars (kg)**	**Bar shape**
1	SM1	8	9	5020	17.84	
2	SM2	8	12	4950	23.5	
3	SM3	8	9	4420	15.71	
4	SM4	8	12	4350	20.62	

Note: This task can be modified without deviating the performance criteria. Helper to be provided to perform the task.

B. Multiple choice questions **Total Marks: 12**

Duration: 10 Minutes

(Preferably written but oral is also permitted)

1. What will be the lap length of 25mm diameter rebar to extend a column? 1 Mark
   a. 1000 mm.
   b. 1400 mm.
   c. **1250 mm**.
   d. 1300 mm.

2. What is the minimum number of main rebar required for a rectangular column? 2 Marks
   a. 2
   b. 5
   c. 3
   d. **4**

3. Rearrange the sequence of beam reinforcement. 2 Marks
   A. Hang top main rebar horizontally using required support
   B. Insert bottom extra rebar from end of the beam
   C. Insert bottom main bars and tie on its position
   D. Mark and insert required number of stirrups
   a. ADBC
   b. DBAC
   c. **ADCB**
   d. BCDA

4. What is the maximum percentage of splicing is allowed in a single lapping zone? 1 Mark
   a. 60%
   b. 40%
   c. **50%**
   d. 70%

5. Which of the following is the common gauge of binding wire used for reinforcement work? 2 Marks
   a. 17 to 20
   b. 12 to 13
   c. 8 to 10
   d. 22 to 25

6. Which of the following tie is recommended for lapping of rebar? 2 Marks
   a. Crown tie
   b. Slash tie
   c. Hair pin tie
   d. **Splice tie**

7. Which one of the following statement you feel is incorrect while tying the cages? 2 Marks
   a. Ensure that all twisted ends of ties are bent inwards away from concrete face**.**
   b. Check cover to reinforcement is correct at all locations.
   c. All the rebar are positioned with equal spacing by considering line and level.
   d. **Alternate intersections of vertical and horizontal rebar can be tied**.

criterias for selection of cutting blades
difference in 1 way and 2 way slab
difference types of concrete (nominal mix)
what is prefab reinfo and its applications

C. Viva questions **Total Marks: 8**
Duration: 5 Minutes

(These questions could be asked during practical observation)

1. What are the common checks required after fabricating reinforcement cages? 2 Marks
   Possible answers:
   a. Check for number of bar
   b. Check for diameter of the bar
   c. Check for spacing of both main bar and stirrups
   d. Check for dimension, alignment and plumb.
   e. Check for pin rods, spacer bar, chair and hook
   f. Check for cover from all the sides
   g. Check for lap length
   h. Check for stiffness of cage and ties

2. why staggering should be for lapping ? 2 Marks
   Possible answers
   a. To achieve required strength and for structural requirement.
   b. To avoid reinforcement congestion.
   c. To improve concrete consolidation and reduce segregation.
   d. Easy load transfer between rebar and increase structural stability.

3. What is the purpose of ensuring proper cover while fixing rebar in RCC structure?
   2 Marks
   Possible answers
   a. Cover blocks are placed to prevent the steel bars from getting exposed to the atmosphere.
   b. Cover blocks are used to place and position the rebar as per the requirement.
   c. To avoid corrosion of the rebar used in RCC.
   d. To provide fire protection to the rebar used in RCC.
   e. To increase life of structure decrease the maintenance cost.

4. Explain the sequence of footing reinforcement? 2 Marks

   Possible answers:
   a. Clean the PCC with water
   b. Mark the layout of footing and column with red oxide
   c. Place end rebar at both the directions
   d. Mark spacing on the end rebar
   e. Place intermediate rebar and fix on its position
   f. Stand column reinforcement by providing inclined supports
   g. Mark stirrup spacing on the main bar
   h. Insert and tie stirrups as per the marking

7.4 CON/N8001: Work effectively in a team to deliver desired results at the workplace

A. Practical questions **Total Marks: 80**

Assessor is required to assess this NOS bases on his/her observation skill and knowledge to observe, ask questions and assess trainee while performing all core NOS's during the practical task for following points:

- How the candidate communicates work related information to team member or to assessor. 10 Marks
  - Is the candidate able to explain the process/sequence before performing every task? (Like, bar bending, cutting, placing and tying etc.)
  - Is the candidate able to communicate properly with other candidate while mark spacing on the main bar?
- How the candidate escalated deviations to the seniors/assessor. 15 Marks
  - If the candidate reduced the length of rebar due to some obstruction (while fixing column reinforcement)
  - If the candidate changed the orientation of the footing due to some obstruction (lack of space)
- How the candidate addresses and reports problems. 15 Marks
  - If the candidate noticed damaged tool or material (**Compulsory:** assessor to provide damaged tool or material to the candidate to assess this skill)
  - If candidate noticed shortage of materials while performing task (Assessor to provide less quantity of cover blocks to assess this skill)
  - If trainee facing problem with shortage of working space
  - If trainee found lack of illumination while performing the task.
- How a person receive and follow the instructions given by seniors/assessor. 15 Marks
  - Is candidate able to follow class room disciplines?
  - Is candidate able to follow instructions given by assessor?
- How a person seeks clarifications and resolves the issues raised during performing the task. 15 Marks
  - Is the candidate able to clarify if the information given for particular task is insufficient? (**Compulsory:** Assessor to provide insufficient information i.e. do not provide spacing details for any one location)
- How a person works as a team, like, proper cooperation, timely handing over tools and materials, helping and advising team members, etc. 15 Marks
  - Is the candidate able to take support of team member? (While shifting lengthy rebar, while checking measurements and alignments etc.)
  - Is the candidate able to hand over the tools timely to other candidate? (For example cutting machine, bending machine, measurement tape etc.)

B. Multiple choice questions **Total Marks: 12**
Duration: 10 Minutes

(Preferably written but oral is also permitted)

1. What action should be taken if bar bending machine power switch got damaged? 2 Marks
   a. Pass information to the team member
   b. Hide from the team member
   c. Continue work with the same machine
   d. Pass information to the other team member

2. What is supposed to be done if the rebar cutting tool gets damaged while executing the task? 3 Marks
   a. Hide the problem with senior
   b. Put blame on other team member
   c. **Inform to the reporting senior about the damage**
   d. Dispose the damaged tool without informing anybody

3. At the start of the work, the bar bender must inform his helpers regarding _____. 3 Marks
   a. The nature of the engineer-in-charge
   b. The weather forecast
   c. **The description of work and technique to be used**
   d. The likely punishment for not completing in time

4. What should the bar bender do after completion of reinforcement work for column? 2 Marks
   a. **Inform the shuttering team about the completion of work**
   b. Hand over the task to electrical team
   c. Inform client/customer about the completion of work
   d. Don to inform any body

5. Which of the following is considered as a negative development for a team? 2 Marks
   a. Cooperation
   b. Mutual understanding
   c. **Communication gap**
   d. Helping each other

C. Viva questions **Total Marks: 8**
Duration: 3 Minutes

(These questions could be asked during practical observation)

1. How a team can build good relationship with interfacing team? 4 Marks
   Possible answers:
   a. Timely handing over the materials
   b. Timely handing over the tools and equipment
   c. Timely handing over the work front
   d. Knowledge sharing with interfacing team
   e. Providing feedback and advices to the interfacing team
   f. Maintaining clear communication with interfacing team

2. What are the features of a good team 4 Marks
   Possible answers:
   a. Cooperation with team members
   b. Knowledge sharing with team members
   c. Advising team members with known skills
   d. Avoid spreading rumours within the team
   e. Respecting the opinions of each team member
   f. Motivating the team members to achieve desired outcomes

7.5 CON/N8002: Plan and organize work to meet expected outcomes

A. Practical questions **Total Marks: 80**

Assessor is required to assess this NOS bases on his/her observation skill and knowledge to observe, ask questions and assess trainee while performing all core NOS's during the practical task for following points:

- How a person understand the targets and time line set by supervisor. 15 Marks
  - Is candidate able understand the target clearly? (**compulsory**) (Ex. Type of rebar, type of ties, spacing details, cover details, duration for each task etc.)
- How a person plan activities as per schedule and sequence. 15 Marks
  - Is candidate able to explain the plan and sequence before performing any core task? (**Compulsory:** assessor to ask candidate to explain the sequence of task (for any core task)
- How a person provide guidance to the subordinates to obtain desired outcome. 10 Marks
  - Is candidate able to guide other candidate while working together? (Ex. While transferring level using tube level, marking cutting length, placing and tying rebar etc.)
- How a person arrange required resources prior to commencement of work. 15 Marks
  - Is candidate able to arrange right quantity of material? (Ex. Quantity of rebar, binding wire, number of helper, tools etc.)
- How a person utilize resources effectively during performing the task. 10 Marks
  - Is candidate able to use the rebar, binding wire, and other accessories within the allowable waste limit?
  - Is able to engage helpers properly?
- How a person adhere to the standard instructions while performing the task. 15 Marks
  - Is candidate able to follow standard instructions? (Ex. Class room discipline, using proper PPE's, care on tools, materials and surrounding environments etc.)

B. Multiple choice questions **Total Marks: 12**
Duration: 10 Minutes

(Preferably written but oral is also permitted)

1. Which of the following document is essential to understand the timelines to compete the targets? 2 Marks
   a. Work schedule
   b. Job card
   c. Work permit
   d. Drawing and specifications

2. What is the first thing a bar bender should do for starting a new work? 2 Marks
   a. Collect the materials
   b. Collect the tools
   c. **Discuss and plan the details of the work with his supervisor**
   d. Discuss and plan the details of the work with the client

3. Which of the following is not the resource for a bar bender to complete the task? 2 Marks
   a. Rebar with different diameter
   b. **Assistant mason**
   c. Helper bar bender
   d. Bar bending machine

4. What must a bar bender do if the allocated helpers are more than the requirement? 2 Marks
   a. Insist helpers to take leave
   b. **Engage extra helpers for other reinforcement related work**
   c. Force helpers to do your work
   d. Engage extra helpers for masonry work

5. What is the approximate quantity of binding wire required to tie 1 MT rebar for slab reinforcement? 2 Marks
   a. 12 to 15 kg
   b. **8 to 10 kg**
   c. 3 to 5 kg
   d. 15 to 20 kg

6. What would happen if a bar bender produces a lot of output in given time but without adhering to the quality specifications? 2 Marks
   a. The supervisor would love it
   b. The team may earn a bonus from the employer
   c. Nothing would happen
   d. **The work may fail while inspection and may get rejected**

C. Viva questions

Total Marks: 8
Duration: 5 Minutes

(These questions could be asked during practical observation)

1. What are the points to be considered while planning an activity? 2 Marks
   Possible answers:
   a. Specification of the work
   b. Quantity of the work
   c. Time line to complete the task
   d. Sequence of work
   e. Resource required to complete the work
   f. Risk involved in the work

2. What must be included in the briefing of the subordinates before start of the work? 2 Marks
   Possible answers:
   a. Content/ scope of work
   b. Work practices
   c. Safety hazards
   d. Use of PPEs
   e. Special precautions

3. What are the resources that need to be arranged before start of a reinforcement work? 4 Marks
   Possible answers:
   a. Materials (rebar, binding wire, PPE's)
   b. Power tools (Bar bending machine, bar shearing machine, rebar cutter, lifting appliances)
   c. Hand tools (bending lever, binding hook, hammer, chisel, hacksaw etc.)
   d. Measuring instruments (measuring tape, SWG, right angle, plumb bob, spirit level etc.)
   e. Man power (helper bar bender, assistant bar bender, supervisor, engineer)
   f. Documents (drawing, BBS, specifications, work schedule etc.)

7.6 CON/N9001: Work according to personal health, safety and environment protocol at construction site

A. Practical questions **Total Marks: 80**
Duration: 30 Minutes

Assessor is required to assess this NOS bases on his/her observation skill and knowledge to observe, ask questions and assess trainee while performing all core NOS's during the practical task for following points (If particular outcome is not covered in any of the core NOS's, assessor need to insist candidate to perform the activities):

- How person identify hazards, risks in site and report to seniors 10 Marks
  - Is candidate able to escalate hazards, risks to the senior? (Ex. Damaged tools, unguarded machineries, inadequate illumination, co-worker working at height without using safety harness, damaged electrical cables etc.)
- How a person respond to emergency and evacuation procedures in case of accidents, fires. 8 Marks
  - Is candidate able to explain the emergency evacuation procedure in case of different emergencies? (Ex. Fire, building collapse, flood etc.)
- Use of personal protective equipment listed below (**Compulsory**). 30 Marks
  (Use of PPEs specified at NOS is mandatory for all the assesse and candidate should score 100% mark in this particular outcome.)
  - Is candidate able to demonstrate the use of all personal protective equipment's? (Ex. Helmet, harness, safety goggles, safety shoes, hand gloves, gum boot, earplug, dust mask, reflective jacket, shoulder pack, etc.
  - Is the candidate able to list PPE's as per the particular task? (Ex. While rebar bending, while rebar cutting, while rebar placing and tying etc.)
- Identification and operation procedure for fire extinguishers. 8 Marks
  - Is candidate able to identify different types of fire extinguishers? (Ex. DCP, CO2, Foam etc.).
  - Is candidate able to demonstrate the operating procedure for different types of fire extinguishers? (Assessor to insist candidate to perform this task
- Handling technique of tools, materials and equipment. 8 Marks
  - Is candidate able to explain the handling techniques of tools, materials and equipment? (Ex. Operating power tools, shifting rebar etc.)
- Adhere to safe working practices while working at height, using tools and equipment, material shifting, working with hazardous materials etc. 8 Marks
  -
  - Is the candidate aware of the safety precutions while working with power tools
  - What are safety protection equipmnts
- Ensure cleaning, housekeeping and waste disposal. 8 Marks
  - Is candidate able to plan housekeeping while performing the task?
  - Is candidate able explain the method to shift waste to designated yard? (Ex. shifting of rebar scrap to a designated scrap yard, stacking rebar based on the length, diameter and type of rebar, stacking waste binding wires in a designated scarp yard etc.)

B. Multiple choice questions **Total Marks: 12**
Duration: 10 Minutes

(Preferably written but oral is also permitted)

1. Identify the safety sign shown below. 2 Marks

a. **Safe assembly area**
b. Fire exit
c. Meeting area
d. Cafeteria

2. To lift reinforcement steel from the ground to the 5th floor, which of the following lifting methods would you suggest? 2 Marks
a. Manually.
b. Material hoisting machine.
c. Fork lift.
d. **Tower crane.**

3. What are the three basic requirements of a fire? 2 Marks
a. Fuel, heat and hydrogen
b. **Fuel, heat and oxygen**
c. Fuel, heat and Sulphur
d. Fuel, heat and nitrogen

4. To shift rebar from the bar bending yard to the work location, which group of basic PPEs would you insist that worker must use? 2 Marks
a. **Safety shoe, safety helmet, hand gloves, shoulder pack**.
b. Safety shoe, safety helmet, safety belt, shoulders pack.
c. Safety shoe, safety helmet, safety belt, safety goggle.
d. Safety shoe, safety helmet, ear plug, safety goggle.

5. Which one of the following statement you feel is unsafe while using a bar bending machine? 2 Marks
a. Not allowed to operate the bar bending machine if you are not fully conscious and alert.
b. **Bar bending machines can be operated by any worker without training.**
c. Never use the machine under the influence of alcohol, drug or medication**.**
d. Be very careful where you place your hands when the machine start bending the bars.

6. Which of the following statement is correct while handling materials manually? 2 Marks
a. Keep the load away from your body
b. **Keep your back straight at all times**
c. Keep your feet as close as possible
d. Twist your body while carrying load

C. Viva questions **Total Marks: 8**
Duration: 4 Minutes

(These questions could be asked during practical observation)

1. What precautions should be taken while using Fall Protection Equipment? 3 Marks
   Possible answers:
   a. Inspect the equipment before each use
   b. Replace defective equipment
   c. Report the defects in the equipment to supervisor
   d. Understand instructions and limitations on use
   e. Proper fitting and adjusting to be done

2. State the first aid procedure for burns. 3 Marks
   Possible answers
   a. Shift the person to safe area.
   b. Remove burnt clothing.
   c. Run cool water over burnt area.
   d. Clean and dry the injured area.
   e. Apply antibiotic cream on the affected area.
   f. Cover the burns with sterile bandage.
   g. Report and document the incident.

3. State the purpose of waste disposal 2 Marks
   Possible answers
   a. To maintain cleanliness
   b. To avoid accidents
   c. To avoid mixing of useful materials with waste
   d. To avoid fire hazards
   e. To utilise the area effectively

8. Assessment Evidence Form

Trainee name: **Trainee roll number:**

Centre name/ Code Date:

This is to confirm that the trainee has handed over the final job to the assessor.
(For each task separate sheet can be used)

Assessor to affix photographs of the practical output (end product)

Trainee's signature: _____

Trainee's name (please print): _____

Assessor's signature: _____

Assessor's name (please print): _____

Centre Head's seal and signature: _____

9. Assessment summary

Assessor's comments

……

……

……

This is to confirm that the trainee has undertaken the assessment for the job role of Bar Bender & Steel Fixer.

Trainee's signature: _____

Trainee's name (please print): _____

Assessor's signature: _____

Assessor's name (please print): _____

Centre Head's seal and signature: _____

Trainee's photo ID (other than the Institute ID): _____

Assessment completion date: _____

10. Assessment Summary Sheets

ASSESSMENT SUMMARY
Qualification Pack - Bar Bender & Steel Fixer Level- 4

Training Provider :	**Testing Centre**
Affiliation No.	**Accreditation No.**

Candidate Detail	Roll No. :	Roll No. :	Roll No. :	Roll No. :	Roll No. :	Roll No. :
	Batch:	Batch:	Batch:	Batch:	Batch:	Batch:
	Name:	Name:	Name:	Name:	Name:	Name:

Assessment Summary :

NOS No.	Allotted (Marks)			Marks Marks Obtained			Marks Obtained			Marks Obtained			Marks Obtained			Marks Obtained			Marks Obtained		
	Skill (Practical)	Knowledge		Skill (Practical)	Knowledge		Skill (Practical)	Knowledge		Skill (Practical)	Knowledge		Skill (Practical)	Knowledge		Skill (Practical)	Knowledge		Skill (Practical)	Knowledge	
		Theory	Viva		Theory	Viva		Theory	Viva		Theory	Viva		Theory	Viva		Theory	Viva		Theory	Viva
CON/N0204	80	12	8																		
CON/N0205	80	12	8																		
CON/N0206	80	12	8																		
CON/N8001	80	12	8																		
CON/N8002	80	12	8																		
CON/N9001	80	12	8																		
Total : 800	**480**	**72**	**48**																		
Percentage weightage	**80%**	**12%**	**8%**																		
Mimimum pass % to qualify	**70%**	**70%**																			
				Result : Passed/Failed			**Result : Passed/Failed**			**Result : Passed/Failed**			**Result : Passed/Failed**			**Result : Passed/Failed**			**Result : Passed/Failed**		

Assessors Name: **Signature :**

Assessing Body Representative Name: **Signature :**

Assessment Agency : **Date**

	1. Roll No. & Name:	4. Roll No. & Name:	
	2. Roll No. & Name:	5. Roll No. & Name:	
	3. Roll No. & Name:	6. Roll No. & Name:	

Ref.QP Code- CON/Q0203	Assessment Sheet for NOS No. - CON/N0204		Marks Obtained by candidates					
QP & NOS Detail	**Skills (Total Marks = 80)**	Allotted Marks	1	2	3	4	5	6
QP : Mason General	1. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for footing and column reinforcement	8						
	2. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for beam reinforcement	8						
CON/N0204: Read and understand routine drawings / sketches and Bar Bending Schedule	3. Read and interpret basic detail from the sketches and bar bending schedule from the drawing provided for slab reinforcement	8						
	4. Calculate number of chairs, spacer bars requirement to be used	10						
	5. Calculate cutting length required for column and footing reinforcement work from the sketches and bar bending schedule provided	12						
	6. Calculate cutting length required for beam reinforcement works from the sketches and bar bending schedule provided	12						
	7. Calculate cutting length required for two way slab reinforcement works from the sketches and bar bending schedule provided	12						
	8. Estimate quantities of work from bar bending schedule	10						
	Total Marks	**80**						
	Knowledge -Theory (Total Marks =12)							
	1. Knowledge about rebar sketches and drawing	1						
	2. Knowledge about the function of spacer bar	1						
	3. knowledge about purpose of chair bars in slab reinforcement	2						
	4. Knowledge about the cover blocks	2						
	5. Knowledge about the hook length	2						
	6. Knowledge about the calculation of cutting length	2						
	7. Knowledge about the unit weight of rebar	2						
	Total Marks	**12**						
	Knowledge - Viva (Total Marks =8)							
	1. Knowledge about use of different types of tie	2						
	2. Knowledge about the cover block	2						
	3. knowledge about purpose of bar bending schedule	2						
	4. Knowledge about the unit weight of rebar	2						
	Total Marks	**8**						

Batch No. & TP:	**Assessors Name:**	**Assessors Signature :**
Assessors Reg. No. :	**Assessors Body(AB) Representative Name:**	**AB Representative Signature :**
		Date :
Assessment Agency :		

	1. Roll No. & Name:		4. Roll No. & Name:						
	2. Roll No. & Name:		5. Roll No. & Name:						
	3. Roll No. & Name:		6. Roll No. & Name:						
Ref.QP Code- CON/Q0203	Assessment Sheet for NOS No. - CON/N0205		Marks Obtained by candidates						
QP & NOS Detail	Skills (Total Marks = 80)	Allotted Marks	1	2	3	4	5	6	
QP : Mason General	1. Select appropriate hand and power tools for cutting rebars as per rebar code for footing, column, beam and two way slab	5							
	2. Mark and cut cutting length as per the dimension from the given bar bending schedule for footing and column reinforcement	8							
CON/N0205: Use hand and power tools for cutting and bending of reinforcement	3. Mark and cut cutting length as per the dimension from the given bar bending schedule for beam reinforcement	8							
	4. Mark and cut cutting length as per the dimension from the given bar bending schedule for two way slab reinforcement	8							
	5. Follow safe operating practices while using hand and power tools for cutting	8							
	6. Bend rebar as per the shape and dimension from the given bar bending schedule for footing and column reinforcement	10							
	7. Bend rebar as per the shape and dimension from the given bar bending schedule for beam reinforcement	10							
	8. Bend rebar as per the shape and dimension from the given bar bending schedule for two way slab reinforcement	10							
	9. Follow safe operating practices while using hand and power tools for bending	8							
	10. Tag and stack rebars after cutting and bending as per standard practices	5							
	Total Marks	**80**							
	Knowledge -MCQ (Total Marks =12)								
	1. Knowledge about power tools used in bar bending work	1							
	2. Knowledge about measurement tools	2							
	3. Knowledge about the capacity of shearing machine	2							
	4. Knowledge about importance of tagging rebar	1							
	5. Knowledge about selection of spandrels	2							
	6.Knowledge about unit weight of steel	2							
	7.Knowledge about allowable tolerance limit for stirrup	2							
	Total Marks	**12**							
	Knowledge Viva (Total Marks = 8)								
	1.Knowledge about the hand and power tools used to cut rebar	2							
	2. Knowledge about safety precautions while operating rebar cutting machine	3							
	3. Knowledge about the tolerance limit for slab reinforcement	3							
	Total Marks	**8**							
Batch No. & TP:									
Assessors Reg. No. :		Assessors Signature :							
		AB Representative Signature :							
Assessment Agency :	Assessors Name:	Date :							
	Assessors Body(AB) Representative Name:								

	1. Roll No. & Name:	4. Roll No. & Name:	
	2. Roll No. & Name:	5. Roll No. & Name:	
	3. Roll No. & Name:	6. Roll No. & Name:	

Ref.QP Code- CON/Q0203	Assessment Sheet for NOS No. - CON/N0206		Marks Obtained by candidates					
QP & NOS Detail	**Skills (Total Marks = 80)**	Allotted Marks	1	2	3	4	5	6
QP : Mason General	1. Read & understand relevant specification given in the sketches/drawing	10						
	2. Follow correct method for insertion/ fixing of rebars for footing and column reinforcement • Column bar length (-)5mm /+3mm • Ring Size ±5mm • Ring spacing ±10 mm/5 spacing's • Footing bar length ±5mm • Footing bar spacing ±5mm • Cage Square ness ±5mm	20						
CON/N0206: Prepare, fabricate, place and fix reinforcement for RCC structures	3. Follow correct method for insertion/ fixing of rebars for beam reinforcement • Top bar length (-)5mm /+3mm • Bottom bar length (-)5mm /+3mm • Ring Size ±5mm • Ring spacing ±10 mm/5 spacing's • Cage Square ness ±5mm	20						
	4. Follow correct method for insertion/ fixing of rebars for slab reinforcement • Square ness of mat ±5 mm • Spacing of rebar ±10 mm/±5 spacing • Level of mat ±5mm • Length of slab ±5mm • Width of slab ±5mm • Diagonal of slab ±5mm • Cut length of main /secondary bars ±5mm	20						
	5. Check quality of reinforcement work with reference to spacing, placement of rebars	10						
	Total Marks	**80**						
	Knowledge -MCQ (Total Marks =12)							
	1. Knowledge about lap length	1						
	2.Knowledge about the general requirement	2						
	3. Knowledge about sequence of beam reinforcement	2						
	4.. Knowledge about percentage of splicing	1						
	5. Knowledge about gauge of binding wire used for reinforcement	2						
	6. Knowledge about the use of ties	2						
	7.Knowledge about the sequence of tying	2						
	Total Marks	**12**						
	Knowledge Viva (Total Marks = 8)							
	1.Knowledge about common checks required after fabricating reinforcement cages	2						
	2.Knowledge about the purpose of staggered lapping	2						
	3. Knowledge about purpose of rebar cover	2						
	4. Knowledge about the sequence of footing reinforcement	2						
	Total Marks	**8**						

Batch No. & TP:

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	Assessors Body(AB) Representative Name:	AB Representative Signature :
Assessment Agency :		Date :

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	2. Roll No. & Name:		5. Roll No. & Name:						
	3. Roll No. & Name:		6. Roll No. & Name:						
Ref.QP Code- CON/Q0203	Assessment Sheet for NOS No. - CON/N8001		Marks Obtained by candidates						
QP & NOS Detail	Skills (Total Marks = 80)	Allotted Marks	1	2	3	4	5	6	
QP : Mason General	1. How the candidate communicate work related information to team member or to assessor	10							
	2. How the candidate escalate deviations to the seniors/assessor	15							
CON/N8001: Work effectively in a team to deliver desired results at the workplace	3. How the candidate address and report problems	15							
	4. How a person receive and follow the instructions given by seniors/assessor	10							
	5. How a person seek clarifications and resolve the issues raised during performing the task	15							
	6. How a person work as team like, proper cooperation, timely handing over tools and materials, helping and advising team members	15							
	Total Marks	80							
	Knowledge -MCQ (Total Marks =12)								
	1. Knowledge about the advantage of working in a team	3							
	2. Knowledge about the importance of communication with team	2							
	3. Knowledge about the role	3							
	4. Knowledge about the reporting procedure	2							
	5. Knowledge about the negatives of team	2							
	Total Marks	12							
	Knowledge Viva (Total Marks = 8)								
	1.Knowledge about relationship with interfacing team	4							
	2.Knowledge about the the features of a good team	4							
	Total Marks	8							
Batch No. & TP:									
Assessors Reg. No. :	Assessors Name:		Assessors Signature :						
	Assessors Body(AB) Representative Name:		AB Representative Signature :						
Assessment Agency :			Date :						

	1. Roll No. & Name:	4. Roll No. & Name:	
	2. Roll No. & Name:	5. Roll No. & Name:	
	3. Roll No. & Name:	6. Roll No. & Name:	

Ref.QP Code- CON/Q0203	Assessment Sheet for NOS No. - CON/N8002		Marks Obtained by candidates					
QP & NOS Detail	**Skills (Total Marks = 80)**	Allotted Marks	1	2	3	4	5	6
QP : Mason General	1. Is candidate able understand the target clearly	15						
	2. Is candidate able to explain the plan and sequence before performing any core task	15						
CON/N8002: Plan and organize work to meet expected outcomes	3. Is candidate able to guide other candidate while working together in a team	10						
	4. Is candidate able to arrange right quantity of material	15						
	5. Is candidate utilize resources effectively during performing the task	10						
	6. Is candidate adhering to the standard instructions while performing the task	15						
	Total Marks	**80**						
	Knowledge -MCQ (Total Marks =12)							
	1. Knowledge about the work schedule	2						
	2.Knowledge about planning of work	2						
	3.Knowledges about resources for reinforcement work	2						
	4. Knowledge about the utilization of resources	2						
	5. Knowledge about the quantity of materials	2						
	6. Knowledge about the quality of work	2						
	Total Marks	**12**						
	Knowledge Viva (Total Marks = 8)							
	1. Knowledge about the planning of work	2						
	2.Knowledge about work specification	2						
	3.Knowledges about resources for reinforcement work	4						
	Total Marks	**8**						

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	Assessors Body(AB) Representative Name:	AB Representative Signature :
Assessment Agency :		Date :

	1. Roll No. & Name:	4. Roll No. & Name:	
	2. Roll No. & Name:	5. Roll No. & Name:	
	3. Roll No. & Name:	6. Roll No. & Name:	

Ref.QP Code- CON/Q0203 Assessment Sheet for NOS No. - CON/N9001			Marks Obtained by candidates					
QP & NOS Detail	**Skills (Total Marks = 80)**	**Allotted Marks**	1	2	3	4	5	6
QP : Mason General	1. Is candidate able to escalate hazards, risks to the senior	10						
	2. Is candidate able to explain the emergency evacuation procedure in case of different emergencies	8						
CON/N9001: Work according to personal health, safety and environment protocol at construction site	3. Is candidate able to demonstrate the use of all personal protective equipment's	25						
	4. Is able to list PPE's for different activities (brick work, IPS flooring, Plastering)	5						
	5. Is candidate able to identify different types of fire extinguishers	3						
	6. Is able to demonstrate the operating procedure for different types of fire extinguishers	5						
	7. Is candidate able to explain the handling techniques of tools, materials and equipment	8						
	8. Is candidate able to place ladder safely	4						
	9. Is candidate able to follow precautionary measures in disposal of harmful chemicals.	4						
	10. Is candidate able explain the method to shift waste to a designated yard	8						
	Total Marks	**80**						
	Knowledge -MCQ (Total Marks =12)							
	1. Knowledge about evacuation procedure	2						
	2. Knowledge about safe handling of materilas	2						
	3. Knowledge about fire safety	2						
	4. Knowledge about the basic PPE	2						
	5. Knowledge about safe practice while using power tool	2						
	6. Knowledge about safe manual lifting of load	2						
	Total Marks	**12**						
	Knowledge Viva (Total Marks = 8)							
	1. Knowledge about the precautions should be taken while using Fall Protection Equipment	3						
	2. Knowledge about the first aid procedure for burns	3						
	3. Knowledge about the purpose of waste disposal	2						
	Total Marks	**8**						

Batch No. & TP:

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	Assessors Body(AB) Representative Name:	AB Representative Signature :
Assessment Agency :		Date :

11. Annexure:

General tolerance related to the practical task N0204 to N0206

Bar Bender & Steel Fixer				
1. Learner Name: _____ 2. Enrolment No: _____ 3. Centre: _____				
S.No	Description	Permitted tolerance	Observed variation	Assessments
General tolerance limit for RCC column and footing				
1.	Square ness of the cage	+/- 5mm		
2.	Alignment of the cage	+/- 5mm		
3.	Spacing of stirrups	+/- 10mm/ 5 spacing		
4.	level of stirrups	+/- 5mm		
5.	Column bar length	-5mm/+3mm		
6.	Stirrup size	+/- 5mm		
7.	Footing bar length	+/- 5mm		
8.	Diagonal of stirrups	+/- 5mm		
9.	Types of ties	As specified		
10.	Stability of ties	Rigid (no shake of rods)		
11.	Straightness of bars (Plumb)	+/- 5mm		
12.	Lap length	+/- 5mm		
13.	Cover (for all sides)	+5mm/-3mm		
Assessor Comment:				
Assessor Name		Assessor Signature		

Bar Bender & Steel Fixer				
1. Learner Name: _____ 2. Enrolment No: _____ 3. Centre: _____				
S.No	Description	Permitted tolerance	Observed variation	Assessments
General tolerance limit for RCC Beam				
1.	Square ness of the cage	+/- 5mm		
2.	Alignment of the cage	+/- 5mm		
3.	Spacing of stirrups	+/- 10mm/ 5 spacing		
4.	Verticality of stirrups	+/- 5mm		
5.	Top bar length	-5mm/+3mm		
6.	Bottom bar length	-5mm/+3mm		
7.	Top bent length	-5mm/+3mm		
8.	Bottom bent length	-5mm/+3mm		
9.	Diagonal of stirrups	+/- 5mm		
10.	Cut length of main/ secondary beam	+/- 5mm		
11.	Types of ties	As specified		
12.	Stability of ties	Rigid (no shake of rods)		
13.	Straightness of bars	Visibly straight		
14.	Lap length	+/- 5mm		
15.	Cover (for all sides)	+5mm/-3mm		
Assessor Comment:				
Assessor Name		Assessor Signature		

Bar Bender & Steel Fixer				
1. Learner Name: _____ 2. Enrolment No: _____ 3. Centre: _____				
S.No	Description	Permitted tolerance	Observed variation	Assessments
General tolerance limit for RCC Slab				
1.	Square ness of the cage	+/- 5mm		
2.	Alignment of the cage	+/- 5mm		
3.	Spacing of rebar	+/- 10mm/ 5 spacing		
4.	level of rebar layers	+/- 5mm		
5.	Cut length of main/ secondary bar	+/- 5mm		
6.	Diagonal of slab	+/- 5mm		
7.	Types of ties	As specified		
8.	Stability of ties	Rigid (no shake of rods)		
9.	Straightness of bars	Visibly straight		
10.	Lap length	+/- 5mm		
11.	Cover (for all sides)	+5mm/-3mm		
Assessor Comment:				
Assessor Name		Assessor Signature		