

National Occupational Skill Standard (NOSS)

Occupational Title : Bar Bender
Level : 1
Sector : Civil Engineering
Sub - Sector : Reinforced Concrete Structure
NOSS ID/NSCO ID :
ISCO NO :



Council for Technical Education and Vocational Training
NATIONAL SKILL TESTING BOARD
Madhyapur Thimi-17, Sanothimi, Bhaktapur, Nepal

Developed: 12-10-2023 (25-06-2080)



The National Skill Standards and Test was developed by:

No.	Name	Designation	Organization
1.	Mr. Narayan Datta Sharma	Advisor	Consultant of the world Bank and ADB
2.	Mr. Bhim Raj Thapa	Coordinator	Ex. Superintendent Engineer, Department of Road
3.	Mr. Chhatra Bir Bajracharya	Member Secretary	Unit chief, Skill Testing and Certification Unit, STD
4.	Mr. Puspa Das Mulmi	Member	Civil Engineer, Lecturer, IOE, Pulchowk
5.	Mr. Dwarika Shrestha	Member	Civil Engineer, Design Division, Department of Building
6.	Mr. Hari Prasad Pandit	Member	Civil Engineer, Lecturer, IOE, Pulchowk
7.	Mr. Arjun K.C.	Guest Member	Technical Officer (Civil Engineer), STD

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Page:2



2045

The National Skill Standards and Test was revised by:

No	Name	Designation	Organization
1.	Er. Iswer Raj Onta	Coordinator	Founder Director, East Consult Pvt.Ltd., Basundhara, Kathmandu
2.	Mr. Chandra Bhakta Nakarmi	Member	Director, National Skill Testing Board
3.	Er. Kabindra Pudasaini	Member	Principal, Multi Skill Pvt. Ltd Bhaktapu
4.	Er. Bhagawan Bahadur Raut	Member	Civil Engineer, Sky Limit Consultancy Dhobighat, Lalitpur
5.	Mr. Dipak Prasad Guragain	Member	Instructor, Global Polytechnic Institute Samakhusi, Kathmandu
6.	Mr. Bachu Ram Chaudhary	Member	Supervisor, G. S. Construction Battisputali, Kathmandu
7.	Mr. Ramhari Devkota	Member	Deputy Director, National Skill Testing Board
8.	Mr. Ishwor Chandra Ghimire	Member	Skill Testing Officer, National Skill Testing Board
9.	Er. Gunananda Jha	Member Secretary	Skill Testing Officer, National Skill Testing Board

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Revised Date: dd/mm/yy

Page:3



2045

The National Occupational Skill Standard Develop by:

No	Name	Designation	Organization
1.	Er. Kishore Kumar Shakya	Coordinator	Construction Technical Sub Committee National Skill Testing Board, Sanothimi, Bhaktapur
2.	Mr. Tek Bahadur Malla	Director	National Skill Testing Board Sanothimi, Bhaktapur
3.	Er. Bijay Krishna Upadhyay	Member	National Society for Earthquake Technology (NSET) Bhaisepati, Lalitpur
4.	Er. Dev Kumar Maharjan	Member	Earthquake Safety Solutions Bhaisepati, Lalitpur
5.	Er. Nripesh Tandukar	Member	KSM Services Pvt Ltd. Lazimpat, Kathmandu
6.	Mr. Surya Adhikari	Member	National Skill Testing Board Sanothimi, Bhaktapur
7.	Er. Kamal Karki	Member	SLATE Consultants Pvt. Ltd. Jwagal, Lalitpur
8.	Er. Saroj Khanal	Member	NSR Consult Gyaneshwor, Kathmandu
9.	Ms. Nishi Shrestha	Member-Secretary	Construction Technical Sub Committee, National Skill Testing Board Sanothimi, Bhaktapur
10.	Mr. Tulsi KC	Facilitator	Sr. Skill Testing Officer, National Skill Testing Board Sanothimi, Bhaktapur
11.	Mr. Suresh Maharjan	Facilitator	Sr. Skill Testing Officer, National Skill Testing Board Sanothimi, Bhaktapur

Recommended by Construction Technical Sub Committee: 12 October 2023 (25 Asoj 2080)



NOSS ID: #

Developed Date: 2023-10-12

Revision Number: ##

Revised Date: dd/mm/yy

Page:4



2045

1	Occupational Title: Bar Bender Level: 1
2	Job Description: Bar Bender, L-1 performs cutting, shaping, placing and binding of steel bars.
3	UNITS OF COMPETENCY: 1. Perform cutting and shaping of steel bars 2. Perform placing and binding of steel bars 3. Perform communication 4. Develop professionalism <i>*Note: Units 3 and 4 are not for testing purpose.</i>
4	Qualifying Notes/Prerequisites: <ul style="list-style-type: none"> • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules Additional Information: <ul style="list-style-type: none"> • Assessment Types: Performance test only • Assessment Duration: 2:30 to 3:30 hours (Full Competency Only) • Recommended Group Size: 8 to 10 candidates



5	Unit No: 1 Unit Title: Perform cutting and shaping of steel bars	Unit code:	
Elements of competency		Performance standards	
1.1 Prepare tool, equipment and materials		1.1.1 Personal Protective Equipment (PPE) used as per job requirements. 1.1.2 Tools and equipment checked for working condition and arranged in designated area. 1.1.3 Faulty tools and equipment tagged, reported to supervisor and sent for repair as per instruction. 1.1.4 Work area checked for safety and prepared accordingly. 1.1.5 Workbench for bending steel bars prepared as per bar type, dimension and bending work. 1.1.6 Bar bending schedule collected from site supervisor.	
1.2 Straighten steel bars		1.2.1 Steel bars of different types and diameter selected as per bar bending schedule. 1.2.2 Foreign materials from steel bar surface removed thoroughly. 1.2.3 Steel bars inspected for physical damage and damaged rejected. 1.2.4 "U" shaped and crooked steel bars straightened to 180 degrees without zigzag and deformation. 1.2.5 Steel bars stacked and tagged as per type, length and diameter.	
1.3 Cut steel bars		1.3.1 Required length of steel bars measured and marked clearly and accurately for cutting. 1.3.2 Steel bars cut straight in marked line. 1.3.3 Cut steel bars stacked and tagged as per type, length and diameter.	
1.4 Bend steel bars		1.4.1 Bending points marked clearly on steel bars or work bench. 1.4.2 Steel bars bent to required shape, angle and length as per bar bending schedule.	



		1.4.3 Bent steel bars stacked and tagged as per type, length and diameter.
	1.5 Clean workplace	1.5.1 Unused and leftover materials collected and stored in designated area. 1.5.2 Tools and equipment cleaned, checked for damage, fault tagged and stored in designated area. 1.5.3 Workplace cleaned neatly and waste disposed as per 3R's principle in designated area.
6	Task Performance Requirements (Tools, Equipment and Materials): <ul style="list-style-type: none"> Measuring tape, marking pen, pencil, chalk, marker, hammer, wire brush, steel bar cutter, hacksaw, pliers, pipes, T die, shear tools, bar bending die, bar straightener lever, bar bending lever, tong, work bench, spirit level, mason's thread, nails, reinforcement bar, jute, binding wires, wire binder, first aid kit and personal protective equipment (PPE). 	
7	Safety and Hygiene (Occupational Health and Safety): <ul style="list-style-type: none"> Use personal protective equipment. Safe handling of materials, tools and equipment. Hazards involved in cutting and lifting steel bars. Take precaution from high tension and distribution lines. Safe handling of debris. Apply safety precautions while working at height. 	



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> • Tools, equipment and materials <ul style="list-style-type: none"> ○ Types ○ Identification ○ Uses ○ Safe handling ○ Storage • Measurement <ul style="list-style-type: none"> ○ FPS and MKS systems ○ Linear measurement ○ Angular measurement • Steel reinforcement <ul style="list-style-type: none"> ○ Types: Mild steel bar, high yield deformed bar (Tor steel), and Thermo mechanically treated (TMT) steel bar ○ Size (diameter in mm and line or suta) ○ Visible defects in steel bar ○ Accepted level of rust in bar ○ Cleaning of steel bars ○ Method of straightening steel bar ○ Methods of bending steel bar 	<ul style="list-style-type: none"> • Perform conversion of linear measurement 	<ul style="list-style-type: none"> • Read and interpret bar bending schedule • Read and interpret tag (weight, quantity)



- Cleaning and waste management
- Record keeping and documentation
- Importance of first aid
- Occupational health and safety rules and regulations.



9	Assessment of Competency					
Unit: 1						
Unit Title: Perform cutting and shaping of steel bars						
Candidate Details			Assessors Detail			
Candidate's Name:			Assessors' Name		ID/License No:	
Registration Number:			1.			
Symbol No:			2.			
Test Centre:			3.			
Test Date:						
Element of competency	Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
1.1 Prepare tool, equipment and materials	1.1.1 Personal Protective Equipment (PPE) used as per job requirements.					
	1.1.2 Tools and equipment checked for working condition and arranged in designated area.					
	1.1.3 Faulty tools and equipment tagged, reported to supervisor and sent for repair as per instruction.					
	1.1.4 Work area checked for safety and prepared accordingly.					
	1.1.5 Workbench for bending steel bars prepared as per bar type, dimension and bending work.					
	1.1.6 Bar bending schedule collected from site supervisor.					
1.2 Straighten steel bars	1.2.1 Steel bars of different types and diameter selected as per					



NOSS ID: #

Developed Date: 2023-10-12

Revision Number: ##

Revised Date: dd/mm/yy

Page:10



2045

	<p>bar bending schedule.</p> <p>1.2.2 Foreign materials from steel bar surface removed thoroughly.</p> <p>1.2.3 Steel bars inspected for physical damage and damaged rejected.</p> <p>1.2.4 "U" shaped and crooked steel bars straightened to 180 degrees without zigzag and deformation.</p> <p>1.2.5 Steel bars stacked and tagged as per type, length and diameter.</p>				
1.3 Cut steel bars	<p>1.3.1 Required length of steel bars measured and marked clearly and accurately for cutting.</p> <p>1.3.2 Steel bars cut straight in marked line.</p> <p>1.3.3 Cut steel bars stacked and tagged as per type, length and diameter.</p>				
1.4 Bend steel bars	<p>1.4.1 Bending points marked clearly on steel bars or work bench.</p> <p>1.4.2 Steel bars bent to required shape, angle and length as per bar bending schedule.</p> <p>1.4.3 Bent steel bars stacked and tagged as per type, length and diameter.</p>				
1.5 Clean workplace	<p>1.5.1 Unused and leftover materials collected and stored in designated area.</p>				



	<p>1.5.2 Tools and equipment cleaned, checked for damage, fault tagged and stored in designated area.</p> <p>1.5.3 Workplace cleaned neatly and waste disposed as per 3R's principle in designated area.</p>				
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WT- Written Test

OQ- Oral Question

PT- Practical Test

DO – Direct Observation

SR- Supervisor’s report

SN–Simulation

RP- Role Play

PG –Photographs

VD- Video

CT – Certificates

TS – Testimonials (Reward)

PP – Product Produced

CS – Case Study



Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Helmet • Apron/Safety Jacket • Goggles • Gloves • Protective shoes • Mask • Safety belt • Ear plug
Bar bending schedule	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Type • Diameter • Shape • Cutting length • Quantity
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Dust • Mud • Rust • Grease • Oil • Adhesive



	<ul style="list-style-type: none"> • Paints
3R's principle	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Reduce • Reuse • Recycle



5	Unit No: 2 Unit Title: Perform placing and fixing of steel works	Unit code:	
Elements of competency		Performance standards	
2.1 Prepare tools, equipment and materials		2.1.1 Personal Protective Equipment (PPE) used as per job requirements. 2.1.2 Tools and equipment checked for working condition and arranged in designated area. 2.1.3 Faulty tools and equipment tagged, reported to supervisor and sent for repair as per instruction. 2.1.4 Work area checked for safety and prepared accordingly. 2.1.5 Workbench for bending steel bars prepared as per bar type, dimension and bending work. 2.1.6 Bar bending schedule collected from site supervisor. 2.1.7 Cover blocks of required shape and size are prepared.	
2.2 Prepare reinforcement components		2.2.1 Steel bars selected as per bar bending schedule. 2.2.2 Steel bars cut to required length. 2.2.3 Steel bars bent to required shape, angle and length. 2.2.4 Stirrups prepared in required shape and size as per bar bending schedule. 2.2.5 Steel reinforcement components prepared by binding steel bars with binding wire in specified intervals. 2.2.6 Steel bars placed in sequence maintaining uniform spacing as per drawing or instruction. 2.2.7 Steel bars tied firmly with binding wire using appropriate types of knots at specified spacing and position.	



	2.3 Bind steel bars	<p>2.3.1 Spacing for steel bars is marked as per instruction.</p> <p>2.3.2 Straight and bent steel bars placed in line, level, and plumb.</p> <p>2.3.3 Steel bars tied firmly with binding wire using appropriate types of knots at specified spacing and position.</p> <p>2.3.4 Fabricated reinforcement cage placed in designated location in line, level and plumb.</p> <p>2.3.5 Specified cover and spacing maintained as per as per drawing or instruction.</p>
	2.4 Clean workplace	<p>2.4.1 Unused and leftover materials collected and stored in designated area.</p> <p>2.4.2 Tools and equipment cleaned, checked for damage, fault tagged and stored in designated area.</p> <p>2.4.3 Workplace cleaned neatly and waste disposed as per 3R's principle in designated area.</p>
6	<p>Task Performance Requirements (Tools, Equipment and Materials):</p> <ul style="list-style-type: none"> Measuring tape, marking pen, pencil, chalk, marker, hammer, wire brush, steel bar cutter, hacksaw, pliers, pipes, T die, shear tools, bar bending die, bar straightener lever, bar bending lever, tong, work bench, spirit level, mason's thread, nails, reinforcement bar, jute, binding wires, wire binder, cover block, cement, sand, first aid kit and personal protective equipment (PPE). 	
7	<p>Safety and Hygiene (Occupational Health and Safety):</p> <ul style="list-style-type: none"> Use personal protective equipment. Safe handling of materials, tools and equipment. Hazards involved in cutting and lifting steel bars. Take precaution from high tension and distribution lines 	



- Safe handling of debris.
- Apply safety precautions while working at height.



NOSS ID: #

Developed Date: 2023-10-12

Revision Number: ##

Revised Date: dd/mm/yy

Page:17



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> • Tools, equipment and materials <ul style="list-style-type: none"> ○ Types ○ Identification ○ Uses ○ Safe handling ○ Storage • Measurement systems <ul style="list-style-type: none"> ○ FPS and MKS systems ○ Linear measurement ○ Angular measurement • Steel reinforcement <ul style="list-style-type: none"> ○ Types ○ Size (diameter in mm and line or suta) ○ Visible defects in steel bar ○ Cleaning of steel bars ○ Accepted level of rust in bars ○ Tagging as per bar size tabulation • Preparation of reinforcement components <ul style="list-style-type: none"> ○ Methods of straightening procedure 	<ul style="list-style-type: none"> • Perform conversion of linear measurement 	<ul style="list-style-type: none"> • Read and interpret bar bending schedule • Read and interpret tag (weight, quantity)



	<ul style="list-style-type: none"> ○ Measurement and marking ○ Methods of cutting ○ Methods of bending ○ Placement and positioning of steel bars ○ Methods of binding ● Diameter of binding wire ● Use of cover blocks, chairs, spacer bar and hanger bars ● Lap length and development length ● Importance and location of lapping of steel bars ● Types of stirrups and ties ● Cleaning and disposal of waste ● Record keeping and documentation ● Importance of first aid ● Occupational health and safety rules and regulations 		
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9	Assessment of Competency				
Unit: 2					
Unit Title: Perform placing and fixing of steel works					
Candidate Details			Assessors Detail		
Candidate's Name:			Assessors' Name		ID/License No:
Registration Number:			1.		
Symbol No:			2.		
Test Centre:			3.		
Test Date:					
Element of competency	Performance Standards	Standard Met	Standard Not Met	Evidence Type	Comments
2.1 Prepare tools, equipment and materials	2.1.1 Personal Protective Equipment (PPE) used as per job requirements.				
	2.1.2 Tools and equipment checked for working condition and arranged in designated area.				
	2.1.3 Faulty tools and equipment tagged, reported to supervisor and sent for repair as per instruction.				
	2.1.4 Work area checked for safety and prepared accordingly.				
	2.1.5 Workbench for bending steel bars prepared as per bar type, dimension and bending work.				
	2.1.6 Bar bending schedule collected from site supervisor.				
	2.1.7 Cover blocks of required shape and size are prepared.				



<p>2.2 Prepare reinforcement components</p>	<p>2.2.1 Steel bars selected as per bar bending schedule.</p> <p>2.2.2 Steel bars cut to required length.</p> <p>2.2.3 Steel bars bent to required shape, angle and length.</p> <p>2.2.4 Stirrups prepared in required shape and size as per bar bending schedule.</p> <p>2.2.5 Steel reinforcement components prepared by binding steel bars with binding wire in specified intervals.</p> <p>2.2.6 Steel bars placed in sequence maintaining uniform spacing as per drawing or instruction.</p> <p>2.2.7 Steel bars tied firmly with binding wire using appropriate types of knots at specified spacing and position.</p>				
<p>2.3 Bind steel bars</p>	<p>2.3.1 Spacing for steel bars is marked as per instruction.</p> <p>2.3.2 Straight and bent steel bars placed in line, level, and plumb.</p> <p>2.3.3 Steel bars tied firmly with binding wire using appropriate types of knots at specified spacing and position.</p> <p>2.3.4 Fabricated reinforcement cage placed in designated location in line, level and plumb.</p> <p>2.3.5 Specified cover and spacing maintained as per as per drawing or instruction.</p>				



2.4 Clean workplace	<p>2.4.1 Unused and leftover materials collected and stored in designated area.</p> <p>2.4.2 Tools and equipment cleaned, checked for damage, fault tagged and stored in designated area.</p> <p>2.4.3 Workplace cleaned neatly and waste disposed as per 3R's principle in designated area.</p>				
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WT- Written Test

OQ- Oral Question

PT- Practical Test

DO – Direct Observation

SR- Supervisor’s report

SN-Simulation

RP- Role Play

PG –Photographs

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NOSS ID: #

Developed Date: 2023-10-12

Revision Number: ##

Revised Date: dd/mm/yy

Page:22



2045

Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Helmet • Apron/Safety Jacket • Goggles • Gloves • Protective shoes • Mask • Safety belt • Ear plug
Bar bending schedule	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Type • Diameter • Shape • Cutting length • Quantity
Steel reinforcement components	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Foundation footing • Beams • Columns
3R's principle	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Reduce



	<ul style="list-style-type: none">• Reuse• Recycle
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