

Curriculum on Welding

(For Non-Formal Vocational Education)

Level Prevoc-2

লাইব্রেরী

উপানুষ্ঠানিক শিক্ষা ব্যুরো
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
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Developed by-

Equivalence Non-Formal Vocational Education
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Bureau of Non-Formal Education
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উপানুষ্ঠানিক শিক্ষা ব্যুরো
গ্রন্থাগার
সংযোজন নং৪৪২০
তারিখ

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NATIONAL COMPETENCY STANDARDS

For

Welding

(NTVQF Prevocational Qualification Level 2)

Informal Sector Industry Skills Council

Bangladesh

BANGLADESH TECHNICAL EDUCATION BOARD

December, 2013

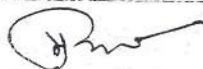



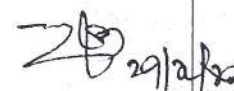

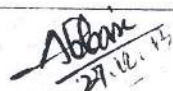
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Bangladesh Technical Education Board
Standard Curriculum Development Committee
National Competency Standard
for

Welding Level Pre-Voc-2
Meeting held on 27-12-2013

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National Technical and Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2 Course Structure

000	Unit Code and Title		UoC Level	Hours
GENERIC – Compulsory (4 UoCs required)				180
1.	GNPV2001A1	Apply basic mathematics	Pre-voc 2	40
2.	GNPV2002A1	Identify Occupational Safety and Health (OSH) Practice in the workplace	Pre-voc 2	20
3.	GNPV2003A1	Apply basic English	Pre-voc 2	60
4.	GNPV2004A1	Apply basic Bangla	Pre-voc 2	60
SECTOR SPECIFIC– Compulsory (2 UoCs required)				60
5.	LEGSSPV2004A1	Interprate Technical drawing	Pre-voc 2	30
6.	LEGSSPV2005A1	Use Hand tools and power tools	Pre-voc 2	30
OCCUPATION SPECIFIC – Compulsory (4 UoCs required)				120
6.	LEGWELPV2006A1	Prepare materials for welding	Pre-voc 2	20
7.	LEGWELPV2007A1	Set Up Welding machine and equipment	Pre-voc 2	20
8.	LEGWELPV2008A1	Weld steel plate by Shielded Metal Arc Welding(SMAW),1F Position	Pre-voc 2	40
9.	LEGWELPV2009A1	Weld steel plate by Shielded Metal Arc Welding(SMAW), 1G Position	Pre-voc 2	40
Total Hours				360

Bangladesh NTVQF with Job Classification

NTVQF Levels	Education Sector			Job Classification
	Pre-Vocation Education	Vocational Education	Technical Education	
NTVQF 6			Diploma in engineering or equivalent	Middle Level Manager /Sub Assistant Engr. etc.
NTVQF 5		National Skill Certificate 5 (NSC 5)		Highly Skilled Worker / Supervisor
NTVQF 4		National Skill Certificate 4 (NSC 4)		Skilled Worker
NTVQF 3		National Skill Certificate 3 (NSC3)		Semi-Skilled Worker
NTVQF 2		National Skill Certificate 2 (NSC 2)		Basic-Skilled Worker
NTVQF 1		National Skill Certificate 1 (NSC 1)		Basic Worker
Pre-Voc 2	National Pre-Vocation Certificate NPVC 2			Pre-Vocation Trainee
Pre-Voc 1	National Pre-Vocation Certificate 1 NPVC 1			Pre-Vocation Trainee

Note: National Technical and Vocational Qualification Framework (NTVQF) At the Completion of the Pre-Vocational Programs the participants would move into training program at the NTVQF level 1

Qualification Level Descriptors

BTVQF Level	Knowledge	Skill	Responsibility	Job Class
6	Comprehensive actual and theoretical knowledge within a specific study area with an awareness of the limits of that knowledge.	Specialised and restricted range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems	Manage a team or teams in workplace activities where there is unpredictable change Identify and design learning programs to develop performance of team members	Supervisor / Middle-Level Manager / Sub Assistant Engineer
5	Very broad knowledge of the underlying, concepts, principles, and processes in a specific study area	Very broad range of cognitive and practical skills required to generate solutions to specific problems in one or more study areas.	Take overall responsibility for completion of tasks in work or study Apply past experiences in solving similar problems	Highly Skilled Worker / Supervisor (NSC 4)
4	Broad knowledge of the underlying, concepts, principles, and processes in a specific study area	Range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information	Take responsibility, within reason, for completion of tasks in work or study Apply past experiences in solving similar problems	Skilled Worker
3	Moderately broad knowledge in a specific study area.	Generic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy	Semi Skilled worker
2	Generic underpinning knowledge in a specific study area.	Generic skills required to carry out simple tasks	Work or study under indirect supervision in a structured context	Medium Skilled Worker
1	Elementary understanding of the underpinning knowledge in a specific study area.	Limited range of skills required to carry out simple tasks	Work or study under direct supervision in a structured context	Generic Skilled Worker

BTVQF Level	Knowledge	Skill	Responsibility	Job Class
Pre-Voc 2	Limited general knowledge	Very limited range of skills and use of tools required to carry out simple tasks	Work or study under direct supervision in a well-defined, structured context.	Pre-Vocation Trainee (NPVC 2)
Pre-Voc 1	Extremely limited general knowledge	Minimal range of skills required to carry out simple tasks	Simple work or study exercises, under direct supervision in a clear, well defined structured context	Pre-Vocation Trainee (NPVC 1)

GENERIC UNITS
Pre-voc 2

National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title	GNPV2001A: Apply Basic Mathematics.
Nominal Hours	40 Hours
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to apply mathematical method such as addition, subtraction, multiplication and division to measure and find out dimension of object in the workplace.
Elements of Competency	Performance Criteria <i>Italicized</i> terms are elaborated in the range of variables
1. Read and write numeric numbers in Bangla and English.	1.1. Numerical numbers from 0 to 9 in Bangla and English is recognized. 1.2. Arrangement in ascending and descending order of numbers in English and Bangla is demonstrated. 1.3. Reading and writing of numerical numbers in Bangla and English are demonstrated.
2. Use mathematical methods.	2.1. Addition, subtraction, multiplication and division are applied. 2.2. <i>Addition</i> of numbers is carried out. 2.3. <i>Subtraction</i> of numbers from other numbers is demonstrated. 2.4. <i>Multiplication</i> of numbers with other numbers is demonstrated. 2.5. <i>Division</i> of numbers by other numbers is carried out. 2.6. Addition, subtraction, multiplication and division In <i>decimal system</i> are solved. 2.7. <i>Percentage</i> of numbers is calculated.
3. Measure in Metric system.	3.1. Units of measurement of length, breadth, height, weight and thickness in <i>metric system</i> is used. 3.2. Measurement of <i>area</i> and <i>volume</i> of solid and liquid in metric system is carried out. 3.3. Measurement of time is applied.
4. Measure in English system.	4.1. Units of measurement of length, breadth, height, weight and thickness in <i>English system</i> is used. 4.2. Measurement of <i>area</i> and <i>volume</i> of solid and liquid in English system is carried out. 4.3. Measurement of time is applied.
Range of Variables	
Variable	Range (May include but not limited to):
1. Tools and resources.	Tools and resources include but not limited to. 1.1. Calculator. 1.2. Measuring tape. 1.3. Ruler. 1.4. Marking chalk. 1.5. Ball pen. 1.6. Pencil.

	1.7. Marker. 1.8. White board. 1.9. Flip charts.
2. Task	Mathematical methods include but not limited to. 2.1. Addition in Metric and English system. 2.2. Subtraction in Metric and English system. 2.3. Multiplication in Metric and English system. 2.4. Division in Metric and English system. 2.5. Calculation of percentage. 2.6. Finding out units of area and volume. 2.7. Finding out of units of weight of liquid and solid.
3. Workplace information.	Information includes but not limited to. 3.1. Charts of numbers. 3.2. Manuals. 3.3. Specification of different items.
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency.	1.1. Use of appropriate mathematical methods. 1.2. Performance of appropriate mathematical methods. 1.3. Use of appropriate assessing method. 1.4. Use of appropriate delivery method.
2. Underpinning knowledge.	2.1. Calculation requirements in the workplace. 2.2. Selection of appropriate mathematical methods. 2.3. Use of tools and equipment. 2.4. Symbols and terminology. 2.5. Use of units.
3. Underpinning skill.	3.1. Identification of appropriate mathematical methods from workplace information. 3.2. Selection of workplace information (Charts, tables, equipment, manuals). 3.3. Application of required skills in the workplace.
4. Required attitude.	4.1. Commitment to occupational safety and health. 4.2. Promptness in carrying out activities. 4.3. Tidiness and timeliness. 4.4. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5. Eagerness to learn. 4.6. Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implication.	The following resources must be provided. 5.1. Tools, equipment and physical facilities. 5.2. Materials and consumables.
6. Assessment methods.	Assessment methods may include but not limited to. 6.1. Log book. 6.2. Continuous assessment 6.3. Oral question

	6.4. Observation 6.5. Written test
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
Accreditation Requirements Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirement set by BTEB.	

National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title	GNPV2002A1 – Identify Occupational Safety & Health (OSH) Practice in the workplace
Nominal Hours	20 Hours
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to apply Occupational Safety & Health (OSH) Practice in the workplace.
Elements of Competency	Performance Criteria Italicized terms are elaborated in the range of variables
1. Identify OSH(Occupation Safety and Health) hazards at workplace.	1.2. Hazards at workplace explained. 1.3. Unsafe tools at workplace are listed. 1.4. Flammable materials are recognized. 1.5. Access and storable materials are preserved in designated place. 1.6. OSH equipment is used safely according to specifications, legislation and standard operating procedures.
2. Perform work in safe condition.	2.1. Appropriate personal protective equipment (PPE) is used. 2.2. Safety signs, symbols and banners are displayed. 2.3. Locations of fire fighting equipment are identified. 2.4. Clear and free emergency exit passages are marked and maintained.
3. Use first aid kits.	3.1. Contents in the first aid kit are selected. 3.2. First aid kit in emergency is used.
4. Maintain healthy and hygiene workplace.	4.1. Aspect of good housekeeping is explained. 4.2. Washing procedure of hands and parts of body is used. 4.3. Useable cleaning agents at workplace are selected. 4.4. Safe drinking water is made available.
Range of Variables	
Variable	Range (May include but not limited to):
1. Hazardous workplace.	Hazard includes but not limited to. 1.1. Accumulation of waste materials. 1.2. Random storage of tools, equipment and furniture. 1.3. Storage of rejected wires, cables and structural materials. 1.4. Storage of flammable materials. 1.5. Congested emergency exit. 1.6. Oil splits floor at workplace.

2. PPE materials and resources.	<p>PPE materials and resources may include but not limited to:</p> <ol style="list-style-type: none"> 2.1. Hand gloves. 2.2. Mask. 2.3. Apron. 2.4. Cap. 2.5. Goggles. 2.6. Safety shoes. 2.7. Cautionary signs, symbols and banners. 2.8. Evacuation program. 2.9. Fire extinguisher. 2.10. Emergency lights. 2.11. Instructions. 2.12. Stretcher.
3. First aid box.	<p>First aid box may include but not limited to.</p> <ol style="list-style-type: none"> 3.1. Sterilized cotton. 3.2. Bandage. 3.3. Scissors. 3.4. Washing agent for injury. 3.5. Medicine for burn. 3.6. Medicine for sudden head-ache.
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency.	<ol style="list-style-type: none"> 1.1. Use of appropriate OSH materials and equipment. 1.2. Handling of OSH materials and equipment. 1.3. Use of appropriate assessing method. 1.4. Use of appropriate delivery method.
2. Underpinning knowledge.	<ol style="list-style-type: none"> 2.1. Maintenance of good OSH condition in workplace. 2.2. Use of symbols. 2.3. Evacuation instructions with pictures and words 2.4. Planning of floor layout of workplace. 2.5. Elimination of hazardous condition. 2.6. Use of PPE.
3. Underpinning skill.	<ol style="list-style-type: none"> 3.1. Use of appropriate PPE.. 3.2. Preparation of signs and banners. 3.4. Displaying of signs and banners.
4. Required attitude.	<ol style="list-style-type: none"> 4.1. Commitment to occupational safety and health. 4.2. Promptness in carrying out activities.. 4.3. Tidiness and timeliness. 4.4. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5. Eagerness to learn. 4.6. Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implication.	<p>The following resources must be provided.</p> <ol style="list-style-type: none"> 5.1. Drawing paper. 5.2. Drawing templates.

	5.3. First Aid kit with required contents. 5.4. PPE 5.5. Pens, pencils, markers, eraser. 5.6. Banners showing OSH practice.
6. Methods of assessment.	6.1. Oral questions. 6.2. Observation. 6.3. Practical Demonstration 6.4. Written test.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
Accreditation Requirements Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirement set by BTEB.	

National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title	GNPV2003A1 – Apply Basic English
Nominal Hours	60 Hours
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to read, and write and speak and communicate in English in the workplace.
Elements of Competency	Performance Criteria Italicized terms are elaborated in the range of variables
1. Recognize the alphabets in English.	1.1. Alphabets in English are recognized. 1.2. Reading and writing words in English are carried out. 1.3. Reading and writing of technical terms are performed.
2. Read and write workplace information in English.	2.1. Reading of safety signals, banners, nameplates are demonstrated. 2.2. Writing of safety signals, banners, nameplates are demonstrated.
3. Introduce yourself in English to others. Speak introductory conversation in English.	3.1. Introductory conversation in English is demonstrated. 3.2. Self introduction to other in English is performed. 3.3. Reading and writing of nameplates on equipment, materials in the workplace are demonstrated. 3.4. Reading English text is performed.
Range of Variables	
Variable	Range (May include but not limited to):
1. Learning aids.	The following resources must be provided to trainees to practice to read, write and speak in English. 1.1. Books / booklets with pictures with names written in English. 1.2. Work sheets / ID cards. 1.3. Catalogues / Manuals. 1.4. White boards / Marker pens. 1.5. Chalk boards / Chalk.. 1.6. OSH information banner. 1.7. Pens / Pencils. 1.8. Flip charts. 1.9. Cassettes player / recorder. 1.10. Cassettes recorded in English conversations. 1.11. Lessons in English conversations. 1.12. TV and monitor. 1.13. Multimedia.
2. Visual information.	Visual aid includes but not limited to. 2.1. Signs. 2.2. Banners. 2.3. Forms. 2.4. Charts. 2.5. Labels.

	2.6. Photographs captions. 2.7. Catalogues. 2.8. Cartoons. 2.9. News papers.
3. Vocabulary practice.	Vocabulary practices include but not limited to. 3.1. Conversation in English between two. 3.2. Group conversation. 3.3. Reading. 3.4. Singing. 3.5. Listening and reproducing.
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency.	1.1. Use of appropriate delivery methods. 1.2. Use of learning aids and equipment. 1.3. Use of appropriate delivery methods.
2. Underpinning knowledge.	2.1. Writing and reading of alphabets. 2.2. Pronunciation of English words. 2.3. Reading workplace information in English. 2.4. Reading words and sentences in English. 2.5. Structures of words and sentences in English. 2.6. Reading of words in English related to occupation.
3. Underpinning skill.	3.1. Writing of alphabets in English. 3.2. Writing words and sentences in English. 3.3. Writing workplace information in English. 3.4. Writing words and sentences in English related to occupation.
4. Required attitude.	4.1. Commitment to occupational safety and health. 4.2. Promptness in carrying out activities.. 4.3. Tidiness and timeliness. 4.4. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5. Eagerness to learn. 4.6. Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implication.	The learning aids and other required materials must be provided to learn English.
6. Methods of assessment.	Method of assessment includes but not limited to. 6.1. Continuous assessment. 6.2. Oral questions. 6.3. Written test 6.4. Reading test 6.5. Speaking test.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
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National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2 Unit of Competency

Unit Code and Title	GNPV2004A1 – Apply Basic Bangla
Nominal Hours	60 Hours
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to read, write, speak and communicate in Bangla in the workplace.
Elements of Competency	Performance Criteria <i>Italicized</i> terms are elaborated in the range of variables
1. Recognize the alphabets in Bangla.	1.1. Alphabets in Bangla are recognized. 1.2. Reading and writing words in Bangla are carried out. 1.3. Reading and writing of technical terms are performed.
2. Read and write workplace information in Bangla.	2.1. Reading of safety signals, banners, nameplates are demonstrated. 2.2. Writing of safety signals, banners, nameplates are demonstrated.
3. Introduce yourself in Bangla to others.	3.1. Self introduction to others in Bangla is performed. 3.2. Reading and writing of nameplates on equipment, materials in the workplace are demonstrated. 3.3. Reading Bangla text is performed.
Range of Variables	
Variable	Range (May include but not limited to):
1. Learning aids.	The following resources must be provided to trainees to practice to read, write and speak in Bangla. 1.1. Books / booklets with pictures with names written in Bangla. 1.2. Work sheets / ID cards. 1.3. Catalogues / Manuals. 1.4. White boards / Marker pens. 1.5. Chalk boards / Chalk.. 1.6. OSH information banner. 1.7. Pens / Pencils. 1.8. Flip charts. 1.9. Cassettes player / recorder. 1.10. Cassettes recorded in Bangla conversations. 1.11. Lessons in Bangla conversations. 1.12. TV and monitor. 1.13. Multimedia.
2. Visual information.	Visual aid includes but not limited to. 2.1. Banners. 2.2. Forms. 2.3. Charts. 2.4. Labels. 2.5. Photographs captions. 2.6. Catalogues. 2.7. News papers.

3. Vocabulary practice.	Vocabulary practices include but not limited to. 3.1. Conversation in Bangla between two. 3.2. Conversation In Bangla in groups. 3.3. Reading 3.4. Singing in Bangla. 3.5. Listening and reproducing.
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.	
1. Critical aspect of competency	1.1. Use of appropriate assessing methods. 1.2. Use of learning aids and equipment. 1.3. Use of appropriate delivery methods.
2. Underpinning knowledge.	2.1. Writing and reading of alphabets. 2.2. Pronunciation of Bangla words. 2.3. Reading workplace information in Bangla. 2.4. Reading words and sentences in Bangla. 2.5. Structures of words and sentences in Bangla. 2.6. Reading of words in Bangla related to occupation.
3. Underpinning skill.	3.1. Writing of alphabets in Bangla . 3.2. Writing words and sentences in Bangla. 3.3. Writing workplace information in Bangla. 3.4. Writing words and sentences in Bangla related to occupation.
4. Required attitude.	4.1. Commitment to occupational safety and health. 4.2. Promptness in carrying out activities. 4.3. Tidiness and timeliness. 4.4. Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5. Eagerness to learn. 4.6. Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implication.	5.1 The learning aids and other required materials must be provided to learn Bangla.
6. Methods of assessment.	Method of assessment includes but not limited to. 6.1. Continuous assessment. 6.2. Oral questions. 6.3. Written test. 6.4. Reading test 6.5. Speaking test.
7. Context of assessment.	Competency may be assessed in the workplace or in a simulated workplace.
Accreditation Requirements Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirement set by BTEB.	

SECTOR SPECIFIC UNITS
Pre-voc 2

National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title :	LEGSSPV2005A1 – Interpret Technical Drawings
Nominal Hours:	30 hours
Unit Descriptor:	<p>This unit covers the knowledge, skill and attitude required in interpreting drawings and specification in light engineering manuals.</p> <p>It includes the following steps: identify information, identify drawings and specifications, interpret drawings and specifications, and apply occupational health and safety procedures.</p>
Elements of Competency	<p align="center">Performance Criteria</p> <p>Bold italicized words are detailed in the Range of variables</p>
1. Identify drawings from manuals	<p>1.1 Appropriate Manuals, are identified and accessed as per job requirements.</p> <p>1.2 Version and date of manual are checked to ensure up-to-date specifications of tools, equipment, materials and procedure.</p>
2. Identify drawings and specifications	<p>2.1 Relevant drawings and specifications are correctly identified as instructions.</p> <p>2.2 Terms and abbreviations are identified.</p> <p>2.3 Signs and symbols are identified</p>
3. Interpret drawing and specifications	<p>3.1 Drawings and specifications are interpreted in accordance with job requirements and industry practices.</p> <p>3.2 Schedules, dimension and specifications contained in drawings are interpreted.</p>
4. Store manuals	<p>4.1 Documents are stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements.</p>

Range of Variables

Variables	Range (May Include but not limited to):
1. Documents	<p>1.1 Manufacturer's Specification and Manual</p> <p>1.3 Maintenance procedure Manual</p> <p>1.5 Quality Manual</p> <p>1.6 Manual of Instruction</p>
2. Drawings	<p>2.1 Technical Drawings</p> <p>2.2 Sketches</p>
3. Specifications	<p>3.1 Product specifications</p> <p>3.2 Performance specifications</p> <p>3.3 Method specifications</p>
4. Instructions	<p>4.1 Orders</p> <p>4.2 Special Orders</p>
5. Terms and abbreviations	Refers to all terms and abbreviations associated with the informal sector
6. Signs and symbols	Include all signs and symbols associated with the informal sector

Evidence Guide:

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment requires evidence that the candidate 1.1 Interpreted drawings and specifications in appropriate manuals.
2. Underpinning knowledge	2.2 Identification of Signs and Symbols 2.3 Identification of Units of Measurement 2.4 Identification of Units of Conversion 2.5 Drawing and Specifications 2.6 Terms and Abbreviations Used
3. Underpinning Skills	3.1 Identifying appropriate manuals 3.2 Identifying and Interpreting drawings and specifications 3.3 Storing manuals
4. Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided 5.1 Availability of all manuals 5.2 Accessibility of storage area
6. Methods of assessment	Competency must be assessed by 6.1 Direct observation 6.2 Demonstration 6.3 Oral questioning/Written
7. Context of assessment	7.1 Competency may be assessed in the actual workplace individually by direct observation or in a simulated workplace.

Accreditation Requirements

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National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit of Competency	LEGSSPV2006A1 - Use Hand Tools and Power Tools
Nominal Hours:	30 hours
Unit Descriptor:	This unit covers the knowledge, skill and attitude in using appropriate hand tools and power tools It includes the following steps: identify tools, use hand tools, use hand-held power tools, practice OHS, and clean up.
Elements of Competency	<p>Performance Criteria</p> <p><i>Bold italicized</i> words are detailed in the Range of variables</p>
1. Identify Tools	<p>1.1 Appropriate tools are selected based on job requirements</p> <p>1.2 Functions of tools are explained properly.</p> <p>1.3 Hand tools and Power tools are prepared according to workplace procedures.</p> <p>1.4 Sources of power supply for power tools recognized</p>
2. Use hand tools	<p>2.1 PPE is selected and worn as per workplace practice.</p> <p>2.1 Appropriate tool is used to perform task according to Workplace procedures.</p> <p>2.2 Proper hand-eye coordination is applied in the use of hand tools</p> <p>2.3 Unsafe or faulty tools are identified and marked for Repair according to workplace procedures.</p>
3. Use power tools	<p>3.1 Source of power supply is identified and power connection is made in accordance with work safety Requirements.</p> <p>3.2 Proper sequence of operations is applied in using hand-held power tools to perform task as per Specifications.</p> <p>3.3 Unsafe or faulty tools are identified and marked for Repair according to workplace procedures.</p>
4. Perform routine maintenance	<p>4.1 Tools and equipment are cleaned according to workplace instructions</p> <p>4.2 Routine maintenance is performed as per workplace practice.</p>
5. Clean and store	<p>5.1 Work place is cleaned and cleared waste materials as per OHS regulations.</p> <p>5.2 Waste materials are disposed according to OHS and workplace requirements.</p> <p>5.3 Suppress dust devices are used to minimize health risk as per workplace practice.</p> <p>5.4 Accidents and emergency cases are reported to proper authority as per requirement</p>

6. Store tools and equipment	6.1 Inventory of tools equipment are conducted and recorded as per stock register by using forms . 6.2 Tools and equipment are cleaned and stored safely in appropriate location according to workplace procedure and manufacturer's specifications
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Range of Variables

Variables	Range (May Include but not limited to):
1. Routine Maintenance	2.1 Adjusting 2.2 Aligning 2.3 Cleaning 2.4 Hand sharpening 2.5 Lubricating 2.6 Scraping 2.6 Simple Tool Repairs 2.7 Tightening
2. Hand Tools	3.1 Adjustable wrench 3.2 Bench vise 3.3 C-Clamp 3.4 Chisels 3.5 Die and stock 3.6 Drill bits 3.7 Files of all cross-sectional shapes and types = 3.8 Hammers 3.9 Hand drill 3.10 Measuring Tapes 3.11 Picks/Mattocks 3.12 Pliers 3.13 Scarpers 3.14 Screw drives 3.15 Sledge Hammers 3.16 Spanners and Wrenches 3.17 Spatula/Putty Knives 3.18 Taps 3.19 Triangle 3.20 Try square 3.21 Vice grip 3.22 Wire Cutters
3. Power Tools	4.1 Angle Grinder/Off hand grinder 4.2 Power saw 4.3 Hand drill machine 4.4 Pedestal grinders
4.Task	4.1 Cutting 4.2 Sizing 4.3 Finishing
5. Instructions	5.1 Manufacturer's Specification and instruction for specific tools/equipment 5.2 Workplace orders and instructions 5.3 Work schedule documentation

6. PPE	6.1	Dust mask
	6.2	Safety glasses/ Goggles
	6.3	Gloves
	6.4	Safety Shoes/ boots
	6.5	Aprons
	6.6	Face masks
	6.7	Overalls/boiler suit
	6.8	Helmet/Hand shield
	6.9	Ear plug
	6.10	Arm guard
7. Forms	7.1	Maintenance schedule forms
	7.2	Requisition slip
	7.3	Inventory Form
	7.4	Procedures

Evidence Guide:

The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirement of the current version of the Unit of Competency.

1. Critical aspects of competency	Assessment requires evidence that the candidate: Demonstrated knowledge in using hand tools and hand-held power tools 1.2 Satisfied the requirements mentioned in the performance Criteria and Range of Variables
2. Underpinning knowledge	2.1 Types of Tools 2.1.1 Hand Tools 2.1.2 Power Tools 2.2 Function of Tools 2.3 Procedures in the Use of Hand Tools and Power Tools 2.5 Preventive Maintenance 2.6 Storage Procedures
3. Underpinning Skills	3.1 Selecting appropriate Tools 3.2 Using Hand Tools Correctly 3.3 Using power tools Correctly 3.4 Performing Preventive Maintenance 3.5 Practicing OHS 3.6 Storing tools and equipment 3.7 Cleaning up
4 Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided 5.1 Adequate workplace 5.2 Construction materials 5.3 Tools appropriate to the construction process

	5.4 Information and documentation 5.5 Product specifications 5.6 Manual, codes, Standards and reference materials
6. Methods of assessment	Competency must be assessed by 6.1 Direct observation 6.2 Oral or written questioning 6.3 Testimony from supervisors, colleagues or appropriate persons
7. Context of assessment	7.1 Competency may be assessed in the actual workplace individually by direct observation

Accreditation Requirements

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OCCUPATION SPECIFIC UNITS
Pre-voc 2

National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title:	LEGWELPV2007A1 - Prepare Material for welding
Nominal Hours:	20 hours
Unit Descriptor:	<p>This unit covers the knowledge, skills, and attitude required to prepare steel plate for manual metal arc welding.</p> <p>It includes sorting and removing unnecessary items, arranging necessary items, setting equipment and cutting materials.</p>
Elements of Competency	<p>Performance Criteria</p> <p><i>Bold italicized</i> words are detailed in the Range of Variables</p>
1. Use PPE	<p>1.1 <i>PPE</i> (Personal Protective equipment) are selected and collected as per job requirement.</p> <p>1.2 PPE is worn as per requirement.</p>
2. Collect tools and materials	<p>2.1 Necessary <i>tools</i> and <i>equipment</i> are selected and collected as per requirement.</p> <p>2.2 <i>Materials</i> are collected as per <i>specification</i>.</p>
3. Cut and prepare edge of materials	<p>3.1 Cutting tools and equipment are set as per requirement.</p> <p>3.2 <i>Materials</i> are <i>cut</i> to specified dimension/<i>specifications</i>.</p> <p>3.3 Edge is prepared in accordance with company or industry requirements and safety procedure.</p>
4. Clean surfaces and edges	<p>4.1 Surfaces and edges to be <i>cleaned</i> are identified.</p> <p>4.2 Surfaces and edges are <i>cleaned</i> to required specifications in accordance with company or industry requirements and safety procedure.</p>
5. Sort tools and equipment & remove unnecessary materials.	<p>5.1 Reusable, recyclable materials are sorted in accordance With job categories.</p> <p>5.2 Tools and equipment are cleaned and stored as per workplace practice.</p> <p>5.2 Waste materials are disposed as per workplace practice.</p>

Range of Variables

Variables	Range (May Include but not limited to) :
1. Materials	<p>1.1 Mild steel</p> <p>1.2 Carbon steel</p>
2. Cut	<p>Cut material using</p> <p>2.1 Hacksaw</p> <p>2.2 Shearing machine</p> <p>2.3 Disc cutter</p>
2. Tools and Equipment	<p>2.1 Bench vise</p> <p>2.2 C-Clamp</p> <p>2.3 Goggles</p> <p>2.4 Hammers</p>

	2.5 Hacksaw 2.6 Measuring Tapes 2.7 Scarpers 2.8 Try square 2.9 Chisel 2.10 Hand grinder 2.11 Disc cutter 2.11 Shearing machine
3. Specification	3.1 Welding codes 3.2 Retience Industry standards 3.3 Client specification
4. Cleaning	Surfaces and edges are cleaned by 4.1 Grinding or sanding 4.2 Filing 4.3 Chemical washing (Degreaser) 4.4 Brushing

Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Perform edge preparation in accordance with Work place standard (WPS) and safety procedures 1.2 Use edge preparation equipment and tools in accordance with the requirements or manufacturer's instructions
2. Underpinning knowledge	2.1 Methods of edge preparation 2.2 Importance of edge preparation 2.3 Safety procedures for cutting and grinding
3. Underpinning Skills	3.1 Measuring and communication skills 3.2 Setting tools and cutting equipment 3.4 Cutting techniques 3.5 Grinding techniques 3.6 Observance of safety procedures
4. Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided: 4.1 Relevant documentation such as WPS and working drawing 4.2 Supplies and materials 4.3 Cutting equipment and facilities 4.4 Grinding equipment and facilities 4.5 Measuring tools 4.6 PPE 4.7 Stand-by fire fighting equipment

6. Methods of assessment	Competency must be assessed through 5.1 Demonstration 5.2 Oral questioning 5.2 Written test
7. Context of assessment	7.1 Competency must be assessed while a task is being undertaken in the work place or in simulated work place.

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National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code Title:	LEGWELPV2008A1- Set Up Welding Machine and Equipment
Nominal Hours:	20
Unit Descriptor:	This unit covers the knowledge, skills and attitude required to prepare equipment for SMAW
Elements of Competency	<p>PERFORMANCE CRITERIA</p> <p><i>Italicized terms</i> are elaborated in the Range of Variables</p>
1. Set up welding machine	<p>1.1 PPE (Personal Protective equipment) is selected collected and worn.</p> <p>1.2 Requirements for welding is determined from job requirements, welding procedures and specifications and/or technical drawings.</p> <p>1.2 <i>Welding machine</i> is set up in accordance with job requirements, welding procedures and specifications, technical drawings and manufacturer's instructions.</p> <p>1.3 Welding machine is connected to an Independent power supply and wired up or set to the <i>polarity</i> indicated in the welding procedures /specifications or as recommended by the manufacturer.</p> <p>1.4 Current and voltage fine-tuned or adjusted consistent with job requirements to produce acceptable weld.</p>
2. Set up welding equipment	<p>2.1 Welding equipment and consumables are identified from job requirements, welding procedures and specifications.</p> <p>2.2 Welding equipment and consumables are set-up in accordance with job requirements, welding procedures and specifications and/or manufacturer's instructions.</p>
3. Set up welding positioners, jigs and fixtures	<p>3.1 Rails, jigs and fixtures are provided and in conformity with job requirements.</p> <p>3.2 Work items/materials are protected from strong winds, drafts and rainfall</p>

RANGE OF VARIABLE

VARIABLE	RANGE (May include but not limited to):
1. Welding machine	1.1 Welding Machine –A/C and D/C
2. Polarity	2.1 Direct current – electrode positive (reverse polarity) 2.2 Direct current – electrode negative (straight polarity)
3. Accessories	3.1 welding cables 3.2 electrode holders

EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate</p> <p>1.1 Set up and install welding machine, accessories, welding positioners, jigs and fixtures and pre-heating equipment within allotted time and in accordance with OH&S rules and accessible and convenient location.</p> <p>1.2 Applied housekeeping and 5S practices</p>
2. Underpinning knowledge	2.1 Types and uses of welding equipment and accessories

	2.2 Power requirement and capacity of welding machine and its accessories 2.3 Operating capacity of welding machine and accessories 2.4 Basic electricity 2.5 Shop safety, housekeeping and 5S procedures
3. Underpinning skills	3.1 Setting and operating welding machine and accessories 3.2 Communication skills 3.3 Recognizing operational abnormalities and faults in welding machine and accessories 3.4 Fine tuning of welding machine and accessories for optimum operation 3.5 Minor repairs/maintenance of welding machine and accessories 3.6 Use of PPE
4. Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1 Appropriately ventilated work area/shop with welding facilities, machines and accessories 5.2 PPE
6. Method of assessment	Competency must be assessed through: Observation Oral questioning
7. Context of assessment	Competency to be assessed while a task is being undertaken in the workplace or in a simulated workplace setting.

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National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2
Unit of Competency

Unit Code and Title:	LEGWELPV2009A1 - Weld steel plates by Shielded Metal Arc Welding (SMAW) (1F Position)
Nominal Hours:	40 hours
Unit Descriptor:	<p>This unit covers the skills, knowledge and attitudes required to welding carbon steel plate by arc welding machine.</p> <p>It includes collecting tools and materials preparing surface, setting welding equipment and accessories, tacking and welding in 1F position.</p>
Elements of competency	<p>Performance Criteria</p> <p>Bold italicized words are detailed in the Range of Variables</p>
1. Prepare for welding	<p>2.1 PPE (Personal Protective Equipment) are selected and collected and worn as per job requirement.</p> <p>1.1 Tools and equipment are selected and collected as per requirement.</p> <p>1.3 Materials and consumable are collected as per specification.</p>
2. Clean and prepare Surface	<p>2.1 Surface is cleaned in accordance with acceptable cleaning procedure and standards.</p> <p>2.2 Surface is prepared in accordance with acceptable procedure and standards.</p>
3. Set up arc welding machine and accessories	<p>3.1 Machine and accessories are set in accordance with requirement.</p> <p>3.2 Transformer/ Generator is secured in proper places.</p> <p>3.3 Welding and polarity are selected and adjusted according to material, type of joint, position and welding electrode.</p>
4. Perform welding	<p>4.1 Plates are aligned and secured for welding as per requirement.</p> <p>4.2 Work pieces is tack welded in positions as per requirement.</p> <p>4.2 Plate is welded as per specification/drawing.</p> <p>4.4 Weld is visually checked and defects are rectified as required.</p>
5. Clean work place and store tools and equipment	<p>5.1 Work place is cleaned as per work place standard(WPS).</p> <p>5.2 Waste materials are disposed as per WPS.</p> <p>5.3 Tools and equipment are stored as per work place practice.</p>

Range of Variables

Variable	Range (May Include but not limited to) :
1. Materials	1.1 Carbon steel 1.2 Mild steel.
2. Tools and Equipment	2.1 SMAW set 2.2 Hand hack saw & power hack saw, file ,rail, anvil 2.3 Grinder, Pedestal grinder
3. Welding Position	1.1 1F
4. Defects	2.1 Porosity 2.2 Pinholes/Blowholes 2.2 Undercut 2.4 Spatters 2.5 Slag inclusion 2.6 Concavity/convexity 2.10 Cracks 2.11 Lack of fusion 2.10 lack of penetration 2.14 Overlap 2.15 Misalignment 2.16 War page

Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate welded carbon steel plates in 1F positions to acceptable standard following the approved WPS.
2. Underpinning knowledge	2.2 Materials and consumables (Electrodes, Base Metal) 2.3 Welding Equipment and Tools 2.5 Welding codes 2.6 Weld defects
3. Underpinning Skills	3.1 Materials and consumables (Electrodes, Base Metal) 3.2 Welding Equipment and Tools 3.3 Welding codes 3.4 Weld defects
4.Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1 Appropriately ventilated work area/shop with welding facilities and equipment 5.2 Supplies and materials 5.3 PPE 5.4 Relevant documentation such as WPS and working drawing
6. Methods of assessment	Competency must be assessed through: 6.1 Demonstration with oral questioning 6.3 Written test 6.4 Portfolio

7. Context of assessment	7.1 Competency must be assessed while a task is being undertaken in the work place or in simulated work place.
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National Technical Vocational Qualification Framework (NTVQF) for Bangladesh

Welding: Pre-voc 2

Unit of Competency

Unit Code and Title:	LEGWELPV2010A1 - Weld steel plates by Shielded Metal Arc Welding (SMAW)(1G Position)
Nominal Hours:	40 hours
Unit Descriptor:	This unit covers the skills, knowledge and attitudes required to weld steel plate by arc welding machine. It includes collecting tools and materials preparing surface, setting welding equipment and accessories, tacking and welding steel plates using SMAW process in 1G position.
Elements of Competency	<p>PERFORMANCE CRITERIA</p> <p><i>Italicized</i> terms are elaborated in the Range of Variables</p>
1. Prepare for welding	<p>2.1 PPE (Personal Protective Equipment) are selected and collected and worn as per job requirement.</p> <p>1.1 Tools and equipment are selected and collected as per requirement.</p> <p>1.3 Materials and consumable are collected as per specification.</p> <p>1.4 Surface is cleaned in accordance with acceptable cleaning procedure and standards.</p> <p>1.5 Edge is prepared as per specification.</p>
3. Perform root pass	<p>1.1 Welding current and polarity are selected and adjusted according to material, position and welding electrode</p> <p>1.2 Root pass is performed as per requirement.</p> <p>1.3 Weld is visually checked for <i>defects</i> and rectified as required.</p> <p>1.4 Root pass is cleaned as per requirement.</p>
4. Weld subsequent/ filling passes	<p>3.1 Subsequent/ filling passes are performed as per requirement.</p> <p>3.2 Weld is checked visually, and defects are rectified as required.</p>
4. Perform capping	<p>4.1 Capping is performed as required.</p> <p>4.2 Weld is checked visually, and defects are rectified as required.</p>
5. Clean work place and store tools and equipment	<p>5.1 Work place is cleaned as per WPS.</p> <p>5.2 Waste materials are disposed as per WPS.</p> <p>5.3 Tools and equipment are stored as per work place practice.</p>

Range of Variables

Variable	Range (May Include but not limited to) :
1. Materials	1.1 Carbon steel 1.2 Mild steel.
2. Tools and Equipment	2.1 SMAW set 2.2 Hand hack saw & power hack saw, file. 2.3 Grinder, Pedestal grinder
3. Welding Position	1.1 1G
4. Defects	2.1 Porosity 2.2 Pinholes/Blowholes 2.2 Undercut 2.4 Spatters 2.5 Slag inclusion 2.6 Concavity/convexity 2.10 Cracks 2.11 Lack of fusion 2.10 lack of penetration 2.14 Overlap 2.15 Misalignment 2.16 War page

Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate welded carbon steel plates in 1G position to acceptable standard following the approved WPS.
2. Underpinning knowledge	2.1 Materials and consumables (Electrodes, Base Metal) 2.2 Welding Equipment and Tools 2.3 Welding codes 2.4 Weld defects
3. Underpinning Skills	3.1 Measuring skills 3.2 Communication skills 3.3 Rectifying weld defects 3.4 Applying weld techniques 3.5 Handling welding tools and equipment 3.6 Handling welding materials and consumables
4. Required Attitude	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Tidiness and timeliness. 4.4 Respect for rights of peers, sub-ordinates and seniors in workplace. 4.5 Eagerness to learn. 4.6 Communication with peers, sub-ordinate and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1 Appropriately ventilated work area/shop with welding facilities and equipment 5.2 Supplies and materials 5.3 PPE 5.4 Relevant documentation such as WPS and working drawing

6.Method of assessment	Competency must be assessed through: 6.1 Observation with Oral questioning 6.2 Demonstration and interview 6.3 Written test 6.4 Portfolio
7.Context of assessment	7.1 Competency to be assessed while a task is being undertaken in the workplace or in a simulated workplace setting.

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