CONSTRUCTION AND BUILDING TECHNOLOGY

Bricklaying

WorldSkills Occupational Standards

 WSC2022_WSOS20_Bricklaying

worldskills

WorldSkills Occupational Standards (WSOS)

Occupation description and WSOS

The name of the occupation is

Bricklaying

Description of the associated work role(s) or occupation(s)

A bricklayer generally works on commercial and residential projects. They are responsible for building or repairing associated structures in accordance with the construction plans. There is a direct relationship between the nature and quality of the product required and the payment made by the customer. Therefore, the bricklayer has a continuing responsibility to work professionally in order to meet the requirements of the customer and thus maintain and grow the business. This includes working harmoniously with other trades in order to optimize efficiency and minimise mistakes.

Bricklaying is closely associated with other parts of the construction industry, and with the many products that support it, normally for commercial purposes.

The scale of work can vary from small projects to major projects. The bricklayer works internally and externally and in all weather conditions. He or she will interpret construction drawings, perform setting out and measurement, and construct to a high standard finish.

Work organization and self-management, communication and interpersonal skills, problem solving, innovation, and creativity, working accurately are the universal attributes of the outstanding bricklayer. Whether the bricklayer is working alone or in a team the individual takes on a high level of personal responsibility and autonomy.

From working safely and tidily with resilience and endurance through to exceptional planning and scheduling, concentration, precision, accuracy, and attention to detail to achieve an excellent finish every step in the process matters and mistakes are largely irreversible and very costly.

With the international mobility of people, the bricklayer faces rapidly expanding opportunities and challenges. For the talented bricklayer there are many commercial and international opportunities; however, these carry with them the need to understand and work with diverse cultures and trends. The diversity of skills associated with bricklaying is therefore likely to expand.

General notes on the WSOS

The WSOS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the "weighting". The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills that are set out in the Standards Specification. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, provided that this does not distort the weightings assigned by the Standards.

WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work organization and management**	**15**

The individual needs to know and understand:

- The importance of establishing and maintaining customer confidence
- The roles and requirements of architects and related trades
- The value of building and maintaining productive working relationships
- Health and safety legislation, obligations, and documentation
- The situations when personal protective equipment must be used
- The purposes, uses, care, maintenance, and storage of all tools and equipment together with their safety implications
- The purposes, uses, care, and storage of materials
- Sustainability measures applying to the use of "green" materials and recycling
- The ways in which working practices can minimize wastage and help to manage costs
- The principles of workflow and measurement
- The significance of planning, accuracy, checking, and attention to detail in all working practices

The individual shall be able to:

- Interpret customer requirements and manage customer expectations
- Interpret customer requirements in order to meet/improve their design and budgetary requirements
- Interpret the needs of architects and related trades
- Contribute own ideas and demonstrate an openness to innovation and change
- Follow health, safety, and environment standards, rules, and regulations
- Select and use the appropriate personal protective equipment including safety footwear, ear, and eye protection
- Select, use, clean, maintain, and store all tools and equipment safely
- Select, use, and store all materials safely
- Plan and maintain the work area to maximize efficiency
- Measure accurately
- Work efficiently and check progress and outcomes regularly
- Establish and maintain high quality standards and working processes
- Identify problems promptly and manage their resolution

Section		Relative importance (%)
2	**Interpretation of drawings**	**10**

The individual needs to know and understand:

- Trends in the industry including new materials and construction methods
- The essential information that must be included in construction drawings
- The importance of checking for missing information or errors, anticipating, and resolving problems in advance of the 'setting out' process and construction
- The role and use of geometry in construction processes
- Mathematical processes and problem solving
- The common types of problems that can occur within a work process
- Diagnostic approaches to problem solving
- Methods of costing and pricing material, equipment, and work processes

The individual shall be able to:

- Accurately interpret all plans, elevations, sections and enlarged details
- Identify horizontal and vertical key dimensions and all angles
- Identify curved work and mortar joint finishes
- Interpret all project features and their required construction methods
- Establish any features that need special equipment or templates and source these
- Recognize specified bonding patterns and obey bonding rules during construction
- Identify drawing errors or items that require clarification
- Determine and check quantities of materials required to build specified projects
- Measure and calculate accurately
- Produce cost and time estimates

3	**Setting out and measurement**	**20**

The individual needs to know and understand:

- The importance of thinking "top down" to ensure all features can be set out at the start of a project
- The implications for the business/organization of not setting out correctly
- The templates/building aids which may be helpful for construction
- Calculations to assist in measuring and checking the project
- Geometrical techniques to assist with the project

Section		Relative importance (%)
	The individual shall be able to: • Visualize and think through projects, identifying potential challenges early and taking the necessary preventative action • Set out the locations, starting points and lines of projects according to plans and specifications • Set out highly technical designs including brick-on-end, brick-on-edge, raked/inclined, curved projecting, recessing brickwork, archways, corbelling, decorative bonding, and battered walling • Accurately interpret the dimensions from drawings and ensure the design is set out within a given tolerance • Check all horizontal and vertical angles • Lay first courses of bricks to check all angles, curves and dimensions are correct • Produce any templates/building aids that may be helpful when constructing • Set out datum points of reference for projects	
4	**Construction**	**40**
	The individual needs to know and understand: • The impact of health, safety, and environment requirements on projects • The application of bed and cross joints to bricks • The precise cutting and laying of bricks to form ornate features and details • The use of hand or machine cutting techniques for different materials • Positioning and laying of bricks in correct positions	
	The individual shall be able to: • Construct projects in accordance with drawings provided • Construct template or arch supports to meet the design requirements • Select bricks which are true to shape and angle and reject bricks which are chipped • Construct brickwork, maintaining accuracy in dimension to within a given tolerance • Check dimensions regularly and correct where necessary • Maintain accuracy of levels to within given tolerances • Transfer levels accurately • Ensure top courses are flat and smooth • Check the undersides of projecting brickwork are level • Maintain accuracy in plumb to within given tolerances • Check the quality of materials • Maintain accuracy of horizontal, vertical, or diagonal alignments to within given tolerances • Check alignments regularly to ensure all surfaces are flat • Maintain accuracy in angles to within given standard tolerances • Check angles regularly and correct where necessary • Render small components of brickwork to smooth and consistent finishes • Construct basic paving, ensuring surfaces are flat and within given tolerances	

Section		Relative importance (%)
5	**Joint finishing and presentation**	**15**
	The individual needs to know and understand: • The need for all work to be presented to meet customer and related trades needs and expectations • The importance of joint finishing in line with the specifications provided • Mortar setting times and absorbency rates of materials • Presentation including the brushing and cleaning of brickwork plus the tidying and cleaning of the work area • The different techniques of applying different joint finishes	
	The individual shall be able to: • Accurately fulfil the interpretation of drawings • Produce brick cuts which are straight and free of chips • Apply joint finishes: raked, round ironed, flushed, and recessed with all joints full, no holes, and smooth finishes • Produce straight lines which provide sharp edges and crisp appearance • Clean brickwork to remove any trowel marks, smudges, and debris from surfaces • Leave work areas in a suitable condition for inspection and subsequent work • Report positive and negative variances in work processes and results, together with their implications • Organize any waste material so that it can be disposed of or recycled efficiently	
	Total	**100**

References for industry consultation

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/) ILO 7112
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.onetonline.org/)

This WSOS appears to relate most closely to *Brickmasons and Stonemasons:*
https://www.onetonline.org/link/summary/47-2021.00,

and to *Bricklayer:*
http://data.europa.eu/esco/occupation/05f321f8-055b-407d-bf19-e0ddabda56b7

Adjacent occupations can also be explored through these links.

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Shanghai 2022.

Organization	Contact name
Construction Industry Development Board (Malaysia)	Raslim Salleh, General Manager, Skills Competency Development Division