

Technical Description

Bricklaying

Construction and Building Technology



WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

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1 INTRODUCTION

1.1 NAME AND DESCRIPTION OF THE SKILL COMPETITION

1.1.1 The name of the skill competition is

Bricklaying

1.1.2 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.

1.1.3 Number of Competitors per team

Bricklaying is a single Competitor skill competition.

1.1.4 Age limit of Competitors

The Competitors must not be older than 22 years in the year of the Competition.

1.2 THE RELEVANCE AND SIGNIFICANCE OF THIS DOCUMENT

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods, and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 ASSOCIATED DOCUMENTS

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Competition Rules
- WSI – WorldSkills Standards Specification framework
- WSI – WorldSkills Assessment Strategy
- WSI Online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations

2 THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS)

2.1 GENERAL NOTES ON THE WSSS

The WSSS 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/WSSS).

The skill competition is intended to reflect international best practice as described by the WSSS, and to the extent that it is able to. The Standards Specification 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 Standards Specification 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 Specification. This is often referred to as the “weighting”. The sum of all the percentage marks is 100.

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

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

2.2 WORLDSKILLS STANDARDS SPECIFICATION

SECTION		RELATIVE IMPORTANCE (%)
1	Work organization and management	15
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • 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 work flow and measurement • The significance of planning, accuracy, checking, and attention to detail in all working practices 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • 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 	

2	Interpretation of drawings	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • 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 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • 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
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • 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 	

	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Visualize and think through the project, 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 course 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 the project 	
4	Construction	40
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The impact of health, safety, and environment requirements on a project • 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 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • 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 the brickwork, maintaining accuracy in dimension to within a given tolerance • Check dimension regularly and correct where necessary • Maintain accuracy of level to within a given tolerance • Transfer level accurately • Ensure the top course is flat and smooth • Check the underside of projecting brickwork is level • Maintain accuracy in plumb to within a given tolerance • Check the quality of materials • Maintain accuracy of a horizontal, vertical, or diagonal alignments to within a given tolerance • Check alignment regularly to ensure all surfaces are flat • Maintain accuracy in angles to within a 1mm standard tolerance • Check angles regularly and correct where necessary • Render small components of brickwork to a smooth and consistent finish • Construct basic paving ensuring surfaces are flat and within a given tolerance 	

5	Joint finishing and presentation	15
	The individual needs to know and understand: <ul style="list-style-type: none"> • 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 specification provided • Mortar setting times and absorbency rates of materials • Presentation includes 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: <ul style="list-style-type: none"> • Accurately fulfil the drawing interpretation • 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 a smooth finish • Produce straight lines which provide sharp edges and a crisp appearance • Clean the brickwork to remove any trowel marks, smudges, and debris is removed from the surfaces • Leave the work area in a suitable condition for inspection and subsequent work • Report positive and negative variances in the work process and results, together with their implications • Organize any waste material so that it can be disposed of or recycled efficiently 	
	Total	100

3 THE ASSESSMENT STRATEGY AND SPECIFICATION

3.1 GENERAL GUIDANCE

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: measurement and judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards Specification. The Test Project is the assessment vehicle for the skill competition, and also follows the Standards Specification. The CIS enables the timely and accurate recording of marks, and has expanding supportive capacity.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed and developed through an iterative process, to ensure that both together optimize their relationship with the Standards Specification and the Assessment Strategy. They will be submitted to WSI for approval together, in order to demonstrate their quality and conformity with the Standards Specification.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors in order to benefit from the capabilities of the CIS.

4 THE MARKING SCHEME

4.1 GENERAL GUIDANCE

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition; in that it ties assessment to the standards that represent the skill. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards Specification.

By reflecting the weightings in the Standards Specification, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards Specification, if there is no practicable alternative.

The Marking Scheme and Test Project may be developed by one person, or several, or by all Experts. The detailed and final Marking Scheme and Test Project must be approved by the whole Expert Jury prior to submission for independent quality assurance. The exception to this process is for those skill competitions which use an Independent Designer for the development of the Marking Scheme and Test Project. Please see the Rules for further details.

Experts and Independent Designers are required to submit their Marking Schemes and Test Projects for comment and provisional approval well in advance of completion, in order to avoid disappointment or setbacks at a late stage. They are also advised to work with the CIS Team at this intermediate stage, in order to take full advantage of the possibilities of the CIS.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition using the CIS standard spreadsheet or other agreed methods.

4.2 ASSESSMENT CRITERIA

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived in conjunction with the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards Specification; in others they may be totally different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards Specification.

Assessment Criteria are created by the person(s) developing the Marking Scheme, who are free to define criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). It is advisable not to specify either the Assessment Criteria, or the allocation of marks, or the assessment methods, within this Technical Description.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 SUB CRITERIA

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by measurement or judgement, or both measurement and judgement.

Each marking form (Sub Criterion) specified both the day on which it will be marked, and the identity of the marking team.

4.4 ASPECTS

Each Aspect defines, in detail, a single item to be assessed and marked together with the marks, or instructions for how the marks are to be awarded. Aspects are assessed either by measurement or judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it.

The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the skill in the Standards Specification. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1)

	CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE	
	A	B	C	D	E	F	G	H				
STANDARDS SPECIFICATION SECTION	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	10.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00

4.5 ASSESSMENT AND MARKING

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by judgement, measurement, or both. The same marking team must assess and mark all competitors, in all circumstances. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (See 4.6.)

4.6 ASSESSMENT AND MARKING USING JUDGEMENT

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts or separate guidance notes)
- the 0-3 scale to indicate:
 - 0: performance below industry standard
 - 1: performance meets industry standard
 - 2: performance meets and, in specific respects, exceeds industry standard
 - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, with a fourth to coordinate the marking and acting as a judge to prevent compatriot marking.

4.7 ASSESSMENT AND MARKING USING MEASUREMENT

Three Experts will be used to assess each aspect. Unless otherwise stated only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect.

4.8 THE USE OF MEASUREMENT AND JUDGEMENT

Decisions regarding the selection of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

The skill assessment criteria are clear concise aspect specifications which explain exactly how and why a particular mark is awarded. The Experts will decide together on the marking criteria, reference points and the dimensional tolerances on the Measurement Marking Forms.

Where a Competitor's level is not long enough for the distance to be measured, Experts must use a straight edge to cover the full distance and achieve the correct mark.

Straight edges used by the Experts to mark specific marking points must use a straight edge that is the same thickness as a standard level.

Marking plans will be formulated to highlight the marking locations and the Experts will decide upon how and when the Competitors view them.

Following is an example of aspects which may be assessed:

Dimensions, level, plumb, alignment, and angles

- Measured at predetermined reference points

Details

- Alignment and angles checked and measured at predetermined reference points;
- Number of bricks correct;
- Cuts;
- Consistency;
- Radius of curves;
- Projections

Jointing

- Flush and recessed joints – all joints full, no holes, smooth finish;
- Render finish – clean and neat, all joints full, no holes, smooth finish;
- A sample panel of the jointing finishes (made and approved by the Experts) will be on display.

Finish

- Brick cuts – straight, equal, clear of chips;
- Drawing interpretation;
- Cleanliness and finished appearance

Deductions

- A proportion of marks is deducted for each tolerance increment to the marking aspect as decided by the Experts. The amount of the deduction varies depending on the aspect and is itemized on the Measurement Marking Form.

In regard to level, plumb, alignment angles, and dimension, the error deductions will be determined by the Independent Designer as part of the Marking Scheme development. As a reference, the deductions used at the previous international competition are:

- For aspects that are of 1 mark value there will be a .2 deduction per 1mm of error.
- For aspects that are of 0.5 mark value there will be a .1 deduction per 1mm of error.

4.10 SKILL ASSESSMENT PROCEDURES

The Experts will be divided into marking groups to deal with each section of the marking criteria.

Each module/task/section will be completed on the assigned day so that progressive marking can take place.

The marking of modules will start when all Competitors have finished their module.

To ensure transparency, each Competitor is provided the same evaluation sheet as used by the Experts:

- Horizontal dimension will be checked level with the top of the first course;
- Plumb and level will be checked 10 mm back from the face;
- The marking of alignment must include checks across the full face of the module.
- For checking of alignment the Competitor's levels will be used. For any checks that are longer than the standard levels, a straight edge which is the same thickness as a standard level must be used.

A master set of marking tools provided by the Competition Organizer will be available during familiarization. All measurements are taken using the Competitor's own measuring equipment. When they are not available the master set will be used.

The Experts agree that a majority vote is needed to:

- Change marking scheme (within limits specified in the Technical Description);
- Change Competition sequence or content;
- Agree on a solution for disputes concerning points awarded etc.

The Marking Scheme will also be developed by the Independent Designer during Test Project development. The assessment information is not provided to the marking group until the all Competitors have completed the work that will be assessed.

The panel of Experts will assist the Skill Management Team select the Experts for the judgement group. The Experts selected need to be from at least three different continents and possess the suitable industry and competition experience to fulfil the role.

Four Experts will be used in the Judgement Marking Group. Three Experts will conduct the judging, but the reserve will be used to score to resolve a score dispute or to mark any compatriot Competitors linked to the core judgement group.

5 THE TEST PROJECT

5.1 GENERAL NOTES

Sections 3 and 0 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the skills in each section of the WSSS.

The purpose of the Test Project is to provide full, balanced and authentic opportunities for assessment and marking across the Standards Specification, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme and Standards Specification will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards Specification, or affect the balance of marks within the Standards Specification other than in the circumstances indicated by Section 2.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work.

The Test Project will not assess knowledge of WorldSkills rules and regulations.

This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards Specification. Section 2.2 refers.

5.2 FORMAT/STRUCTURE OF THE TEST PROJECT

The Test Project will be modular with a maximum of four modules.

A module is not deemed complete until all joint finishing has been attempted.

5.3 TEST PROJECT DESIGN REQUIREMENTS

The Test Project should not exceed 600 bricks and the design can include render, paving, blockwork, arch set out, and advanced detail.

The final number of bricks should take into consideration the difficulty of the project.

The Test Project can contain up to a maximum of five modules.

The design of a Test Project module to be built by a Competitor must not exceed 1.65 m as a maximum height. The Competition Organizer is to make step ladders available that are allowable under the WorldSkills Health, Safety, and Environment policy and regulations. If a Competitor is using the ladders in an unsafe manner they will be stopped and given another induction by the ESR for Health, Safety, and Environment (no time penalty incurred).

- Brick cutting is limited to a maximum of 20% of the total number of bricks in reference to the cuts that are not 90°. It can be increased to 30% on small modules.

Approximate percentages of cutting must be presented for each Test Project proposal or change proposal before voting takes place.

As a guide, it is preferable that the first module take no longer than 9 hours. The final module should commence on C3 to allow for progressive marking of the previous modules.

The independent design is to be designed using the standard product sizes of the Competition Organizer.

The design is to be drawn at 1:10 scale and preferably in colour.

There needs to be sufficient space between modules for Experts to carry out progressive marking without disrupting the Competitors.

Clearly understandable jointing plans must be provided to competitors with the working drawings.

5.4 TEST PROJECT DEVELOPMENT

The Test Project MUST be submitted using the templates provided by WorldSkills International (www.worldskills.org/expertcentre). Use the Word template for text documents and DWG template for drawings.

5.4.1 Who develops the Test Project or modules

The Test Project/modules are developed by an Independent Designer.

5.4.2 How and where is the Test Project or modules developed

The Test Project or modules are developed independently.

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
Six (6) months before the Competition	Competitors are notified of any Competition Organizer requirements with regard to safety and/or equipment and materials.
At the Competition	The complete Test Project is presented to the panel of Experts by the Independent Designer. No Expert including the Chief Expert is to receive any information relating to the project design before this time.

5.5 TEST PROJECT VALIDATION

Test Project proposals must be validated and tested through being constructed and timed to prove that it is reasonable for the constraints of the Competition.

5.6 TEST PROJECT SELECTION

The Test Project is selected as follows:

The Test Project is independently designed in line with the specifications described in the Technical Description.

5.7 TEST PROJECT CIRCULATION

The Test Project is circulated via the website as follows:

The Test Project will be developed by an Independent Designer and presented to the panel of Experts at the competition.

The working drawings will be provided to the competitors no later than the Familiarization Day.

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

Coordination of the Test Project will be undertaken by the Skill Competition Manager in communication with the Independent Designer.

5.9 TEST PROJECT CHANGE AT THE COMPETITION

The full project will be presented to the panel of Experts at the competition on C-4 by the Independent Designer.

Due to circumstances relating to the Competition Organizer, such as material and equipment availability and sponsors it is common for the Test Project to have changes made at the Competition to accommodate these circumstances.

A CAD professional and/or the independent designer makes any of the agreed minor changes (if any) to the plans. The amended plans are given to the Competitors during their familiarization on C-2.

5.10 MATERIAL OR MANUFACTURER SPECIFICATIONS

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from www.worldskills.org/infrastructure located in the Expert Centre.

The Competition Organizer will upload photos and specifications of the brick, block and mortar in the Infrastructure List. Samples will not be sent.

Specifications and images of the Competition Organizer's brick saws must also be uploaded in the Infrastructure List at least three months before the competition.

6 SKILL MANAGEMENT AND COMMUNICATION

6.1 DISCUSSION FORUM

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the skill specific Discussion Forum (<http://forums.worldskills.org>). Skill related decisions and communication are only valid if they take place on the forum. The Skill Competition Manager (or an Expert nominated by the Skill Competition Manager) will be the moderator for this Forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

6.2 COMPETITOR INFORMATION

All information for registered Competitors is available from the Competitor Centre (www.worldskills.org/competitorcentre).

This information includes:

- Competition Rules
- Technical Descriptions
- Marking Schemes
- Test Projects
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 TEST PROJECTS [AND MARKING SCHEMES]

Circulated Test Projects will be available from www.worldskills.org/testprojects and the Competitor Centre (www.worldskills.org/competitorcentre).

6.4 DAY-TO-DAY MANAGEMENT

The day-to-day management of the skill during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Skill Competition Manager. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

7 SKILL-SPECIFIC SAFETY REQUIREMENTS

Refer to WorldSkills Health, Safety, and Environment Policy and Regulations for Host country or region regulations.

Competitors are expected to work safely and maintain a safe working area during competition. During competition any Competitor breaking any Health, Safety, and Environment rules, may be required to undertake another workshop safety induction with the ESR for HSE, this will not affect the Competitor's competition working time.

Competitors must not work off any platform during the competition without the approval of the assigned ESR and the Workshop Manager.

The Competition Organizer must supply low decibels masonry saw blades, with a minimum cutting depth of 350mm.

If a Competitor does not use the saw safely and in line with the induction instructions, they can be made to engage in another safety induction to make sure they are aware of their safety obligations. Further misuse can result in the Competitor not being permitted to use the saw during the competition. Competitors can only cut one masonry unit at a time.

If a Competitor uses an approved step ladder supplied by the Competition Organizer, it must be used safely and in accordance with manufacturers' specifications. Failure to do so can result in the Competitor being required to undertake another safety induction regarding the use of this equipment.

8 MATERIALS AND EQUIPMENT

8.1 INFRASTRUCTURE LIST

The Infrastructure List details all equipment, materials and facilities provided by the Competition Organizer.

The Infrastructure List is available at www.worldskills.org/infrastructure.

The Infrastructure List specifies the items and quantities requested by the Skill Competition Manager on behalf of the Experts for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Items supplied by the Competition Organizer are shown in a separate column.

At each Competition, the Skill Competition Manager must review, audit, and update the Infrastructure List in partnership with the Technical Observer in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any requests for increases in space and/or equipment.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

Both block and brick products must be of the highest face quality, as it affects the visual aspects of the projects, impacts on the marking process and it can also significantly affect the amount of waste product.



For C+1 a separate meeting room needs to be made available for discussion of the skill development as competition site deconstruction may be taking place creating noise levels that make discussions very difficult.

8.2 COMPETITOR'S TOOLBOX

The maximum size of a toolbox or the combined volume of toolboxes is 1.25m³ in reference to external dimensions.

Toolboxes must remain in the allocated work area for the duration of the Competition.

8.3 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY COMPETITORS IN THEIR TOOLBOX

ITEM	EXAMPLE
Trowel	
Folding rule	

ITEM	EXAMPLE
Masons hammer	
Square	
Mallet:	
Pencil:	
Lump hammer:	
Angle Bevel	
Spirit level:	
Pointing trowel	
Cleaning tools:	

ITEM	EXAMPLE
Marking out string:	
Large compass:	
Safety footwear:	
Ear and eye protection	
Rendering tools:	

The Competitor's measuring tape, level, and square will be used during assessment. It is the Competitor's responsibility to provide their own measuring tools for assessment. If the Competitor tools have not been made available, the judging tools will be used.

Competitors are allowed to bring digital measuring devices to use during the Competition.

The only power tools that can be used in the Competition site are those supplied by the Competition Organizer.

Profiles are permitted but must be assembled during Competition time.

NOTE: Competitors are not allowed to bring chemicals into the competition site for the purpose of cleaning. Water in open containers or buckets can be used for cleaning brickwork and blockwork with chemical free sponges.

Templates

Items that are in general use in the industry are permitted, but any item that is specific to the project will not be allowed.

30, 45, 60 and 90 degree set square templates are allowed to be brought into the Competition.

Half, quarter, and three-quarter brick templates are allowed to be brought into the Competition. If project specific templates are being used, they must be made during Competition time. For arches or curves the centre should be (if possible) included within the template. The accuracy of the tools used is the responsibility of the Competitor.

8.4 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY EXPERTS

Not applicable.

8.5 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

The use of brick cleaning fluids or oil is not allowed (that is, chemicals).

It will be explained to all Experts and Competitors that nothing is to come into or out of the site unless approved by the Chief Expert or Deputy Chief Expert. This includes any items that are being added or removed from toolboxes.

Power Tools

No power tools are permitted to be used except for:

- Power tools provided by the Competition Organizer, minimum of one tool per four;
- Battery operated drill – provided by Competition Organizer;
- Battery operated jigsaw – provided by Competition Organizer.

Bond Paper:

- A sufficient number of bond paper sheets marked out to bond size for - bricks, blocks, and pavers are to be supplied by the Competition Organizer.

Tools using compressed air are not allowed to be used during the Competition.

8.6 PROPOSED WORKSHOP AND WORKSTATION LAYOUTS

Workshop layouts from previous competitions are available at www.worldskills.org/sitelayout.

Example workshop layout:



NOTE: It is preferable that the bricklaying competition site not be long and narrow as it tends to disadvantage some competitors, can cause congestions with material supply and also has a negative impact on the layout of briefing and meeting areas.

9 SKILL-SPECIFIC RULES

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, internet access, procedures and work flow, and documentation management and distribution.

TOPIC/TASK	SKILL-SPECIFIC RULE
Use of technology – USB, memory sticks	<ul style="list-style-type: none"> • The use of memory sticks and storage devices may be used by Experts during the competition.
Use of technology – personal laptops, tablets and mobile phones	<ul style="list-style-type: none"> • Competitors are not allowed to bring personal laptops, tablets or mobile phones into the workshop. • Experts and Interpreters are allowed to use personal laptops and tablets in the Expert room only. • Experts and Interpreters are not allowed to use mobile phones in the workshop.
Use of technology – personal cameras	<ul style="list-style-type: none"> • Competitors, Experts, and Interpreters are allowed to use personal photo and video taking devices in the workshop but not in any competitor areas. • No mobile phones, photo or video taking devices are allowed to be used during assessment.
Tools/infrastructure	<ul style="list-style-type: none"> • Refer to Technical Description for tools a Competitor is allowed to bring. • Mortar additives may be used to make mortar more workable (can be liquid or powder; data sheets must be sent to the Competition Organizer for approval). • Competitors are allowed to bring digital measuring devices to use during the competition. • The accuracy of the tools used is the responsibility of the Competitor. • No power tools are permitted to be used except for: power tools and battery-operated drills and jigsaws provided by Competition Organizer. • Tools using compressed air are not allowed to be used during the competition. • The use of brick cleaning fluids or oil is not allowed (that is, chemicals).

TOPIC/TASK	SKILL-SPECIFIC RULE
Health, Safety, and Environment	<ul style="list-style-type: none"> • Refer to the WorldSkills Health, Safety, and Environment policy and guidelines document. • The Competition Organizers must supply low decibel saw blades, with a minimum cutting depth of 150mm. • All competitors must be fully briefed about safe working practices and safe use of the saw to the satisfaction of the ESR for Health, Safety and the Environment prior to the start of the competition. • When using the saw, competitors can only cut one brick or block at a time. • Competitors are expected to work safely and maintain a safe working area during competition; they are also responsible for the cleaning of the area near their projects and their designated saw area. • It is the responsibility of all Competitors to remove mortar droppings away from the base of the Test Projects. • After the Competitors have cleared the mortar droppings Experts and workshop assistants can assist the Competitors to clean their whole work area. Experts and assistants must not come in contact with the Test Projects during the cleaning process. • During competition any Competitor breaking any Health, Safety, and Environment rules, may be required to have another workshop safety induction with the ESR for Health, Safety, and Environment during their competition time. • Competitors must not work off any platform during competition without the approval of the ESR for Health, Safety, and Environment and the Workshop Manager.
Templates, aids, etc.	<ul style="list-style-type: none"> • Competitors are allowed to use profiles is but their assembly and positioning must take place during competition time. • The competitor toolkit including any profile stabilisation cannot encroach on any floor space outside of the competitor's allocated area. • Items that are in general use in the industry are permitted, but any item that is specific to the project will not be allowed. • 30, 45, 60 and 90 degree set square templates are allowed to be brought into the competition. • Half, quarter and three-quarter brick templates are allowed to be brought into the competition. • Competitors are allowed to use project specific templates however they must be made during competition time. • For arches or curves the centre will be provided by the Competition Organizer.
Drawings, recording information	<ul style="list-style-type: none"> • All drawings and competition information must be placed in the plastic wallets and returned back to the CE at the end of every competition working day.

TOPIC/TASK	SKILL-SPECIFIC RULE
Equipment failure	<ul style="list-style-type: none"> Any equipment failure must be brought to the attention of the CE immediately. The allowance of time is at the discretion of the CE and the Experts responsible for timekeeping.
Assessment	<ul style="list-style-type: none"> The Competitor's measuring tape and square will be used during assessment. It is the Competitor's responsibility to provide their own measuring tools for use during assessment. If the Competitor fails to leave the equipment for assessment, the CE's or Experts marking set will be used.
Test Project	<ul style="list-style-type: none"> Competitors are permitted to use of dummy joints/fake jointing in the competition Test Project. Only water can be used to clean the brickwork and blockwork.

10 VISITOR AND MEDIA ENGAGEMENT

Following is a list of possibilities to maximize visitor and media engagement:

- Try a trade;
- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status

11 SUSTAINABILITY

This skill competition will focus on the sustainable practices below:

- Recycling;
- Use of 'green' materials;
- Use of completed Test Projects after Competition

12 REFERENCES FOR INDUSTRY CONSULTATION

WorldSkills is committed to ensuring that the WorldSkills Standards Specifications 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 Standards Specification 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/>)
- ESCO: (<https://ec.europa.eu/esco/portal/home>)
- O*NET OnLine (www.onetonline.org/)

This WSSS 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 Standards Specification in place for WorldSkills Kazan 2019.

ORGANIZATION	CONTACT NAME
Construction Industry Development Board, Malaysia	Raslim Salleh, General Manager
Gable Construction (Southern) Ltd	Stewart Cutmore, Owner and Director
Australian Brick and Block Training Foundation	Brendan Coyle, Manager