Technical Description

Carpentry

Construction and Building Technology

worldskills

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:

Effective 22.08.18

Stefan Praschl
Chair of the Competitions Committee

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Vice Chair of the Competitions Committee

1 INTRODUCTION

1.1 NAME AND DESCRIPTION OF THE SKILL COMPETITION

1.1.1 The name of the skill competition is

Carpentry

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

A carpenter generally works on commercial and residential projects predominantly undertaking tasks using timber and timber related products. Carpentry is closely associated with other trades that make up the construction industry, working both individually and as part of a team to complete projects. A carpenter undertakes work both internally and externally within homes of customers and on construction sites in all weather conditions.

He or she will be expected to interpret drawings, set out and measure, cut, form joints using both hand and power tools, assemble, and install finishes to a high standard.

The carpenter's work includes:

- Measuring, cutting, and installing components of new or existing residential and commercial buildings including; floors, wall and roof systems, stairs, interior and exterior finishes, roofing materials, doors, windows, and other finishing components.
- Calculating, cutting and assembly of stair components for concrete stairs, landings and geometrical stairs.
- A focus on accuracy. Measuring and cutting accurately enables higher quality items like trim and moulding which must be finished with great precision.
- Installing timber work and components that have been fabricated in a workshop and transported to the building site.

Carpenters also construct and install components that are seen on the inside and outside of residential or commercial buildings such as sidings, shutter, and roofing materials. They also make moulds for concrete formwork (called shuttering in some countries). Carpenters may also be involved in the design and construction of timber framed buildings such as commercial buildings, dwellings, garages, sheds, gazebos, pergolas, and play houses.

Work organization, self-management, communication, and interpersonal skills are integral parts of a carpenter's skill set along with problem solving, innovation and creativity. The ability to work precisely and accurately are fundamental attributes of an outstanding carpenter. Whether the carpenter is working alone or in a team the individual takes on a high level of personal responsibility and autonomy.

Every step in the carpentry process matters; mistakes may be largely irreversible and could carry a very high cost. A Carpenter must work safely; demonstrate exceptional planning and organization skills, along with concentration and stamina paying attention to detail in order to achieve an excellent finish.

Carpenters must have technology skills to be able to use digital instruments such as GPS location devices, laser levels, electronic distance measurement devices and digital callipers. They must also be able to use specialist construction CAD software and project management (BIM) software.

With the international mobility of people, the carpenter faces rapidly expanding opportunities and challenges. For a talented carpenter there are many commercial and international opportunities. However, these also carry with them the need to understand and work with diverse cultures and trends.

A Carpenter usually receives his or her training by working as an apprentice for between 2-4 years (dependant on country) with a more experienced professional. Apprentices may also attend training at a College or Technical School. They will undertake both theoretical and practical training that will normally include the use of hand and power tools; framing and finish carpentry along with knowledge of building science.

With this training a carpenter has the ability to complete more intricate tasks and achieve a higher degree of accuracy and finish.

1.1.3 Number of Competitors per team

Carpentry 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	**Safe work, organization and management**	**5**
	The individual needs to know and understand: • Task analysis and hazard identification and controls • The appropriate selection and use of personal protective equipment (PPE) • Safe use, care, handling, and storage of tools, equipment, and materials • The importance of interpreting drawings, instructions, and specifications • The importance of time activity planning and attention to detail, in all work practice • The potential environmental impact and sustainability issues associated with a construction project	
	The individual shall be able to: • Comply with relevant health and safety legislation, regulations, and obligations • Identify and control (eliminate, isolate and/or minimize) hazards • Select and use appropriate Personal Protective Equipment when necessary • Safely use, maintain, handle, and store tools, equipment, and materials on site • Complete a project safely, accurately and efficiently, as specified and within a projected timeline • Minimize the environmental impact of a project by efficient work practice, minimizing waste, and by using appropriate equipment	
2	**Business, communication, and interpersonal skills**	**5**
	The individual needs to know and understand: • The roles and responsibilities of parties involved in a construction project including, but not limited to, clients, architects, engineers, and sub trades • Relevant methods of communications between the above parties	
	The individual shall be able to: • Interact with the relevant parties in a construction project • Communicate clearly and comprehensively with parties involved in a construction project.	
3	**Problem solving, innovation, and creativity**	**10**
	The individual needs to know and understand: • Common variables which may affect a construction project such as material availability or material defects • Diagnostic approaches to problem solving • The importance of currency of industry knowledge and likely future developments	

	The individual shall be able to: • Anticipate and pre-empt common variables, for example through material selection. • Solve problems at their root cause, rather than their symptoms • Maintain currency of industry knowledge and trends through research, up-skilling, life-long training, and/or education • Supervise their own work	
4	**Reading and interpreting drawings and written instructions**	**10**
	The individual needs to know and understand: • Relevant conventions used in preparing drawings and written specifications, on paper or through computer assisted drafting (CAD) software and project management software (such as BIM) • How to interpret drawings, written instructions, and specifications • Relevant tolerances for accuracy	
	The individual shall be able to: • Accurately interpret conventionally prepared or Computer Assisted Drafting (CAD) prepared drawings and specifications • Select the correct materials to comply with the drawings and specifications • Where required, extrapolate information, using appropriate means or techniques • Produce work within specified tolerances, or where none are given, to a suitable standard	
5	**Setting out and measuring**	**10**
	The individual needs to know and understand: • The importance of accuracy in all setting out. • The risks and potential consequences of cumulative and compounded errors • Calculations and formulae used both in setting out and confirming accuracy	
	The individual shall be able to: • Set out relevant aspects of a construction project accurately and clearly using conventional measuring tools and digital instruments such as GPS location devices, laser levels, electronic distance measurement devices and digital callipers. • Avoid cumulative and compounded errors • Use appropriate calculations and formulae to confirm accuracy	
6	**Forming joints and preparing members for assembly**	**20**
	The individual needs to know and understand: • The properties of timbers, timber-based construction materials and finished wood materials • Conventional methods of forming joints in timber (called lumber in some countries) • How to select appropriate hand and power tools to cut materials safely and accurately	

	The individual shall be able to: • Confidently work with timber and timber-based materials • Select and safely use hand and power tools to cut joints safely and accurately • Identify and cut joints as specified, or where required can select and cut task appropriate joints	
7	**Assembling project**	**20**
	The individual needs to know and understand: • How to assemble and erect structures, without damage to components, personal risk, or risk to others or property • The appropriate use of fasteners and hardware	
	The individual shall be able to: • Accurately assemble and erect structures without damage to components, personal risk, risk to others, or to property • Select and use specified fasteners, or where required, can select and use appropriate fasteners and hardware	
8	**Finishing**	**20**
	The individual needs to know and understand: • The importance of finishing as specified, or where required finish to an appropriate standard	
	• The individual shall be able to: • Finish to a specification, with attention to surface finishes and avoidance of damage or unsightly marking of components • Produce accurate joints and intersections with no gaps • Attach the members neatly using appropriate fasteners • Where no specification is supplied, finishes to appropriate standards, with attention to the areas above	
	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	1.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	20.00	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

A - Interior joints

- Joints formed neatly and cut accurately to lines;
- Surfaces flat with minimum saw/chisel marks;
- No overcutting at internal joint faces.

B – Dimensions

- Members cut and assembled to a high degree of accuracy.

C - Exterior joints

- Joints formed with no gaps.

D - Neatness of finish, cleanness and general impression

- All members in place;
- No unsightly joints;
- Flat surfaces;
- Flat accurate backing bevels;
- Clean surfaces - minimum pencil marks and stains;
- Neat screw fixings.

E - Deductions

- Complete the project using only the material provided;
- No re-cutting pieces after interior joints are marked;
- No sanding or planning to level joints after assembly.

4.10 SKILL ASSESSMENT PROCEDURES

The skill assessment procedures include the following:

- The Chief Expert sorts the Experts into marking teams while considering WorldSkills experience, language and culture;
- Each Expert marking team is allocated an aspect or aspects of the project to assess for all Competitors.

A – Interior joints

The Experts assess accuracy of cuts to lines and cleanness of joints and cuts.

B - Dimensions

The dimensions to measure are identified on the marking team's drawings

Dimensions are measured by two groups of three Experts; results are compared and re-checked if necessary by designated Experts.

Each dimension is allocated a number of marks in the CIS.

DISCREPANCY	PERCENTAGE OF MARKS
+/- 0 – 1 mm	100% marks
+/- 1 – 2 mm	90% marks
+/- 2 – 3 mm	80% marks
+/- 3 – 4 mm	70% marks
+/- 4 – 5 mm	60% marks
+/- 5 – 6 mm	50% marks
+/- 6 – 7 mm	40% marks
+/- 7 – 8 mm	30% marks
+/- 8 – 9 mm	20% marks
+/-9–10 mm	10% marks
More than 10mm or nothing to mark	0% marks

C - Exterior joints

The groups of joints to assess are identified on the marking team's drawing

The biggest gap in each cluster of joints is measured.

Joints are measured by two groups of three Experts, results are compared and re-checked if necessary by designated Experts.

Each joint will be allocated a number of points on the CIS.

DISCREPANCY	PERCENTAGE OF POINTS
Gaps < 0.5 mm	100% marks
Gaps > 0.5 and < 1.0 mm	80% marks
Gaps > 1.0 and < 1.5 mm	60% marks
Gaps > 1.5 and < 2.0 mm	50% marks
Gaps > 2.0 and < 2.5 mm	40% marks
Gaps > 2.5 and < 3.0 mm	30% marks
Gaps > 3.0 and < 3.5 mm	20% marks
Gaps > 3.5 and < 10 mm	10% marks
Gaps > 10 or Joint not present or not conforming to drawing	0% marks

D - Neatness of finish, cleanness, and general impression

Experts judge the overall finished project for neatness of finish, cleanness, and general impression.

- All members in place;
- No unsightly joints;
- Flat surfaces;
- Flat accurate backing bevels;
- Clean Surfaces – minimum pencil marks and stains;
- Neat screw fixings.

E – Deductions (to be recorded by the signature of at least two Experts)

Up to their deduction credit, Competitors may request:

- Permission to recut (maximum four recuts). Recuts are defined by any removal of wood from the pieces after the interior joints are marked (criteria A). This could be by cutting, planning, chiselling, sanding, or similar;
- A new piece of wood (maximum of two pieces).

The following deductions apply:

- Recuts - 1.25 marks
- New pieces - 2.50 marks

5 THE TEST PROJECT

5.1 GENERAL NOTES

Sections 3 and 4 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 2.1 refers.

5.2 FORMAT/STRUCTURE OF THE TEST PROJECT

The format/structure of the Test Project is a single Test Project with at least three separately assessed modules.

5.3 TEST PROJECT DESIGN REQUIREMENTS

The Test Project must reflect the typical work carried out by a Carpenter.

It should form a complete timber structure when all the modules are joined together; for example, a base structure, a wall structure, and a roof. Other structures may be included such as:

- Stairs/steps;
- Guard rails;
- Trims;
- Decking;
- Cladding.

It should be designed with intersections and joints to challenge the Competitor such as: mitres, mortise and tenon, halving, dovetails birdsmouth, plumb cuts, seat cuts and lip cuts to purlins, and jack rafters.

It is produced from planed timber (called lumber in some countries) with section sizes generally up to 100 cm² and timber-based manufactured boards and materials where appropriate.

It should be possible to complete most of the project without the Competitor having to set out complex geometry on the drawing board.

The Test Project should have an overall volume which will fit comfortably within the allocated competition area detailed in paragraph 5.3, typically no more than 8 m³ and less than 2.4 m in height

It must be capable of being re-used or recycled.

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 is developed by the Experts and submitted no later than six months before the Competition. The proposal does not need to be in the form of full detailed drawings but must show the concept clearly using sketches, 3D drawings, and written details.

5.4.2 How and where is the Test Project or modules developed

The Experts vote for the project on the forum no later than five months before the competition.

5.4.3 When is the Test Project developed

Three months before the competition, an Independent Designer, without a Competitor or vested interest in the competition, completes the drawings for the Test Project with a minimum of 30% change and supplies the drawings to WSI until it is released at the Competition on C-4.

The following documents should be included:

- Drawings with front, side and top view including the main measurements and joint details;
- 3D views;
- Written specifications as necessary;
- Material and Cutting List

5.5 TEST PROJECT VALIDATION

It must be demonstrated that the Test Project can be completed within the material, equipment, knowledge, and time constraints.

This will be demonstrated by:

A photograph of the completed Test Project with details of the time taken to produce each module or 3D CAD drawing with construction details.

- Details of the number of complex and standard pieces used in the project.

5.6 TEST PROJECT SELECTION

The Test Project concept is agreed by the Experts by vote on the Discussion Forum.

5.7 TEST PROJECT CIRCULATION

The Test Project is circulated via the website as follows:

Three months before the competition, an Independent Designer, without a Competitor or vested interest in the competition, completes the drawings for the Test Project and supplies the drawings to the director of skills competitions until it is released at the Competition on C-4.

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

The Independent Designer prepares the project for the competition and communicates with the Skill Competition Manager and Workshop Manager to ensure that all the materials are sourced.

5.9 TEST PROJECT CHANGE AT THE COMPETITION

The Independent Designer makes a minimum 30% change to the project and keeps it confidential until C-4.

The changed project should reflect the level of difficulty contained in the original project.

The Experts can decide to make small changes on C-4 such as taking out a piece or putting in one more within the constraints of the materials list. This can only occur if there is agreement that the Test Project is too hard or too easy.

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 type of material typically used will be posted on the Discussion Forum six months prior to C-4.

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 eight 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.

In addition to Host Country Health, Safety, and Environment regulations, the following are required:

- Be proficient in the safe use of all hand or machine tools used at the competition including those listed on the Infrastructure List;
- All Competitors must use safety glasses when using any power or machine tools/equipment and any hand tool likely to cause or create chips or fragments that may injure the eyes;
- Experts will use the appropriate personal safety equipment when inspecting, checking, or working with a Competitor's project;
- No loose clothing or jewellery is to be worn during the Competition; long hair is to be tied back;
- No electronic devices such as cellular phones and other listening devices are to be used unless the Chief Expert approves the device;
- Competitors must comply with age restrictions applying to woodworking machinery.
- Dust extractors must be used with cutting machines such as routers and mitre saws.

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.

8.2 COMPETITOR'S TOOLBOX

Toolboxes shall be restricted to a maximum internal volume of 1.5m³.

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

Competitors may bring a toolbox with regular Carpenter's hand tools and equipment to enable them to construct the Test Project to full size as long as those tools are not listed on the Infrastructure List.

The Competitors may bring the following machines (battery and/or corded) tools:

- Routers;
- Drill drivers;
- Jig saw;
- Portable planer
- Plunge saw and guides.

Note: these tools will not be supplied to all Competitors by the Competition Organizer.

8.4 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY EXPERTS

Experts are not required to supply any tools, materials, or equipment.

8.5 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

Equipment or tools that are not safe or do not meet the WorldSkills Health, Safety, and Environment Policy and Regulations.

Any tools listed on the Infrastructure List.

Pre-made templates or pre-set bevels.

Portable power tools not listed in 8.3 may be used only by agreement with the Director of Skills Competitions and Director of Sponsorship and Partnership.

8.6 PROPOSED WORKSHOP AND WORKSTATION LAYOUTS

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

Example workshop layout:

8.7 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY WORLDSKILLS

This first list of tools is to be supplied per Competitor:

- One portable table saw capable of cutting bevels to 45 degrees to a depth of greater than 70 mm with similar specifications to DeWalt DWE7480
- One compound mitre saw capable of cutting 70 mm timber a minimum of 45 degrees on both sides with similar specifications to DeWalt DWS 780
- Two mobile dust extractor which works automatically with the mitre and table saws above and are capable of working efficiently with hand held power tools such as routers and planers

This second list is to be supplied for others to share at a ratio of one tool per four Competitors

- Router with 6.8 mm and 12 mm collets with a set of straight bits capable of cutting 12 mm to 20 mm wide and to a depth of up to 40 mm;
- Planer with approximately a 50 mm width of cut;
- Oscillating sander with sanding discs of 80, 100, and 120 grit;
- Portable Jigsaw;
- Plunge/track saw with 1.5 m track with similar specifications to or DeWalt DWS520K;
- Cordless drill driver.

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	• Competitors are not allowed to bring or use memory sticks into the workshop. • Experts and Interpreters are allowed to bring and use memory sticks into the workshop.
Use of Use of technology – personal laptops, tablets and mobile phones– personal laptops	• Competitors are not allowed to bring personal laptops, tablets or mobile phones into the workshop. • Experts and Interpreters are allowed to bring personal laptops, tablets or mobile phones into the workshop. • Experts and Interpreters are not allowed to use personal laptops, tablets or mobile phones while any drawings or documents from the Test Project are open in the workshop from C-4 to C-2.
Use of technology – personal photo and video taking devices	• Competitors are allowed to use personal photo and video taking devices in the workshop at the conclusion of the competition only. • Experts and Interpreters are allowed to use personal photo and video taking devices in the workshop from C-1 to C+1 only.
Drawings, recording information	• Competitors must return all drawings, instructions, and documents produced by themselves to the Chief Experts to be stored in a locked cabinet at the end of each competition day.
Health, Safety, and Environment	• Refer to the WorldSkills Health, Safety, and Environment policy and guidelines document.
Use of technology – USB, memory sticks	• Competitors are not allowed to bring or use memory sticks into the workshop. • Experts and Interpreters are allowed to bring and use memory sticks into the workshop.
Listening to music	• Competitors are allowed to listen to music using personal ear phones during the completion of the project; except when using power tools. • Only MP3 players are allowed, mobile telephones are prohibited.

TOPIC/TASK	SKILL-SPECIFIC RULE
Work procedures	• No bevelling, rounding over edges or removal of arises on members. • No sanding either by hand or machine on Test Project. • During the preparation (cutting process) Competitors may test fit members by hand only. The use of holding devices such as screws, clamps, or assistance from another person is prohibited. • Use of glue and wood filling material is prohibited.

10 VISITOR AND MEDIA ENGAGEMENT

The Carpentry competition area will maximize visitor and media engagement by including the following in their competition area:

- Display screens – a screen that shows visuals of carpentry projects, communicates career opportunities, and Competitor profiles;
- Test Project descriptions – a posting of the Test Project drawing that is in public view;
- Display of completed modules.

11 SUSTAINABILITY

Sustainability will be demonstrated and encouraged in the Carpentry competition area as follows:

- Recycling bins will be provided for paper, metal, plastic, and other recirculation products and one for non-circulation products;
- Use of recycled paper for printing of Competition documents;
- Wood used in the Competition projects is certified by the Host Country as sustainable;
- Toolbox size restricted to a maximum internal volume of 1.5m³;
- The finished Test Project will be reusable after the 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.**oneto**nline.org/)

This WSSS (Section 2) appears most closely to relate to *Carpenter*:
http://data.europa.eu/esco/occupation/2a22ff9e-de3b-408d-b312-5034896cc4f4
or *Construction Carpenters*: https://www.onetonline.org/link/summary/47-2031.01

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
Vocational School, Lenzburg, Switzerland	Michael Hurbin, Specialist Crpenter
Bouwbedrijf Willem Beverloo B.V., Western Europe	Willem Beverloo, Director
Construction Industry Training Board, UK	Gareth Williams, Standards and Qualification Policy Manager (Wales)
Coleg Sir Gar, Wales	Paul Evans, Pan Wales Coordinator for the Inspiring Skills Excellence in Wales Project.
Holzbau Schweiz, Switzerland	Peter Elsasser, Business Unit Manager Education
PCL Constructors Westcoast inc, North America	Randy Callaghan, Workforce Supervisor
Schwarz Holzbaustechnik (CH)	Peter Schwarz, Director
Skills Competitions Ambassador and College Principal	Barry Liles - Skills Competitions Ambassador and College Principal