CONSTRUCTION AND BUILDING TECHNOLOGY

Carpentry

Technical Description

 TD26 v8.0.1 WSC2022

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:

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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

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.

They are 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. 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 playhouses.

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 with a more experienced professional. With this training, a carpenter has the ability to complete tasks that are more intricate 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 – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations.

2 The WorldSkills Occupational Standards (WSOS)

2.1 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.

2.2 WorldSkills Occupational Standards

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 projects safely, accurately and efficiently, as specified and within projected timelines
- Minimize the environmental impact of projects by efficient work practice, minimizing waste, and using appropriate equipment

2	**Business, communication, and interpersonal skills**	3

The individual needs to know and understand:

- The roles and responsibilities of parties involved in construction projects including, but not limited to, clients, architects, engineers, and sub trades
- Relevant methods of communications between the above people

The individual shall be able to:

- Interact with the relevant parties in construction projects
- Communicate clearly and comprehensively with parties involved in construction projects.

Section		Relative importance (%)
3	**Problem solving, innovation, and creativity**	7

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 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**	17

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

Section		Relative importance (%)
	The individual shall be able to: • Set out relevant aspects of construction projects 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 select and cut task appropriate joints	
7	**Assembly**	**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**	**18**
	The individual needs to know and understand: • The importance of finishing as specified, or, where required, finish to an appropriate standard	

Section	Relative importance (%)
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 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. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

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

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and 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 standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition 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, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more independent people with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Rules for further details.

Experts and Independent Assessors are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be 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.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the 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). *The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.*

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub 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) specifies 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, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by measurement or by 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 Standards. 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 refers.)

		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	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. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team.. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

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, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using measurement

Normally three Experts will be used to assess each aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. 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. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 The use of measurement and judgement

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

4.9 Skill assessment strategy

WorldSkills is committed to continuous improvement. This particularly applies to assessment. The SMT is expected to learn from past and alternative practice and build on the validity and quality of assessment and marking.

A - Interior joints

- 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

Assessment and marking are an intense process that depends upon skilful leadership, management, and scrutiny.

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 and cleanness of joints and cuts.

B – Dimensions

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

Two groups of three Experts measure dimensions; when results of these two groups are more than 0.5 mm apart a third team of two Experts is used to confirm measurements.

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

Discrepancy	Percentage of marks
+/- 1 mm	100% of marks
+/- 2 mm	90% of marks
+/- 3 mm	80% of marks
+/- 4 mm	70% of marks
+/- 5 mm	60% of marks
+/- 6 mm	50% of marks
+/- 7 mm	40% of marks
+/- 8 mm	30% of marks
+/- 9 mm	20% of marks
+/- 10 mm	10% of marks
More than 10 mm 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 of three Experts.

Each joint is allocated a number of points on the CIS

Discrepancy	Percentage of points
Gaps < 0.5 mm	100% marks
Gaps ≥ 0.5 mm and < 1.0 mm	80% marks
Gaps ≥ 1.0 mm and < 1.5 mm	60% marks
Gaps ≥ 1.5 mm and < 2.0 mm	50% marks
Gaps ≥ 2.0 mm and < 2.5 mm	40% marks
Gaps ≥ 2.5 mm and < 3.0 mm	30% marks
Gaps ≥ 3.5 mm and < 3.5 mm	20% marks
Gaps ≥ 3.5 mm and < 10 mm	10% marks
Gaps > 10 mm 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;
- 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).

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 applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards 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, or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. 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. Section 2.1 refers.

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.

Most Test Projects (and Marking Schemes) are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Developer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

5.2 Format/structure of the Test Project

The Test Project is a single Test Project with at least three (3) modules assessed in stages.

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, birds mouth, 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, typically no more than 8.0 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/modules are developed independently by all Experts.

5.4.2 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Time	Activity
Prior to the Competition	Experts develop and propose Test Project modules individually.
Six (6) months prior to the Competition	Experts submit their Test Project proposals to the Skill Competition Manager. The proposals do not need to be in the form of full detailed drawings but must show the concept clearly using sketches, 3D drawings, and written details.
Five (5) months prior to the Competition	The Experts vote for three Test Projects on the WorldSkills Discussion Forum. The three Test Project proposals with the highest vote are uploaded as "pre" version to the WorldSkills website.
Three (3) months prior to the Competition	The Independent Test Project Designer completes the concept drawings for the Test Project and send it to the WorldSkills International Skills Competitions Administration Manager. 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
At the Competition on C1	The Test Project/modules are presented to Experts and Competitors.

5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations,

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer is expected to identify one or more independent, expert, and trusted individuals initially to review the Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

5.6 Test Project validation

The Skill Competition Manager coordinates the validation and will ensure that the Test Project/modules can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.7 Test Project selection

Experts shortlist all proposals to three (3) Test Project proposals by a vote on the WorldSkills Discussion Forum.

5.8 Test Project circulation

The Test Project is circulated via the website as follows:

The three shortlisted Test Project/modules are circulated five (5) months prior to the Competition as "pre" version. The final Test Project/modules are presented to Experts and Competitors on C1.

5.9 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules is undertaken by the Skill Competition Manager in collaboration with the Independent Test Project Designer.

5.10 Test Project change

The Independent Test Project Designer shall develop the 30% change to one or more Test Project proposals as required by WorldSkills. This change is presented to the Experts and Competitors at the Competition on C1.

The Independent Test Project Designer is to provide a 3D image with dimensions for the assessment of the project.

5.11 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. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These such items may include those for fault finding modules or modules not circulated.

The type of material, the type of timber typically used is posted on the WorldSkills Discussion Forum six (6) months prior to C-4. The Skill Competition Manager provides the definitive cutting list confidentially to the Workshop Manager no later than three (3) moths prior to 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 Chief Expert (or an Expert nominated by the Chief Expert) 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
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- 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).

6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Topic/task	Best practice procedure
Test Project validation	• The Skill Competition Manager and the Independent Test Project Designer make sure the drawings for the Test Project are correct and all Information is present. • If possible, they build or redesigning the Test Project on CAD with another independent person to make sure all necessary information is on the drawing prior to traveling to the Competition (C-2 weeks).
Test Project design	• The Test Project should be designed in at least 3 modules for the following reasons: Visitors can see something very early (first day); all Competitors are able to finish at least some of the modules and even if they do not finish the whole project it is recognizable; and it spreads the workload of the Experts to mark over all four days.
Release of Test Project	• The Test Project will be shown to the Experts on C1 before the Competitors enter the workshop. • The Test Project will be shown to the Competitors immediately before they start the Competition on C1
Studying the drawing	• Before the competition time starts, all Competitors have 60 minutes to study the drawing.
Questions related to the drawing	• After studying the drawing, the Competitors have 15 minutes for questions about the Test Project drawings to the Skill Management Team and Independent Test Project Designer. • Answers must be given to all when something on the drawing is not 100% clear. Otherwise the Competitors have to figure it out by themselves.
Preparing project material (Competitors)	• The Competitors get the provided project material on C-2 Familiarization Day with a cutting list with quantity, size, and length but without the name and number of modules.

Topic/task	Best practice procedure
Marking preparation (Experts)	• The Skill Competition Manager and Independent Test Project Designer will provide the Chief Expert, Deputy Chief Expert, and Experts with basic information like number of modules and expected time of the Test Project to prepare the marking process on C-4.
Familiarization session C-2	• Competitors are allowed to check the timber • Changing timber will be organize by the Skill Management Team and must be done by the Competitor themself. • Any changing or attempt by themself or not according to the communicated rules will have a penalty applied as if it was a new piece of wood! • Competitors must set and use all provided tools to test and become familiar.

Test Project – test fitting	• During the cutting process Competitors may fit/test cuts to members by hand only. Competitors must NOT use any holding devices such as clamps or screws to assist nor receive outside assistance from any other person. This also applies to the following:
	  • NO Placing of Module 2 Members on Module 1, and
	  • NO Placing of Module 3 Members on Module 2 or 1.

7 Skill-specific safety requirements

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

Task	Safety glasses with side protection	Dust mask	Safety shoes with protective cap	Sturdy shoes with closed toe and heel	Tight fitting work clothes (long trousers)	Hearing protection
General PPE for safe areas				√	√	
Drawing and setting out			√		√	
Marking wood			√		√	
Cutting by hand	√		√		√	
Cutting using power tools	√	√	√		√	√
Assembling projects	√		√		√	

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;
- 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;
- Safety instructions are also in the Briefing Pack;
- The Sponsor is requested to give a safety demonstration of the supplied 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 Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These such items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

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 Competitors toolbox

The total volume of the toolboxes or crates including pallet or transportation box may not exceed 1.5 m³.

(Volume = Length x Height x Width, or V = L x H x W)

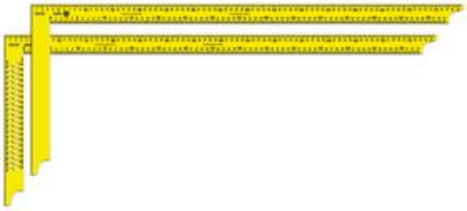
Volume measurement does not include a packing crate, other protective packing material, palette for transportation, wheels, etc.

8.3 Materials, equipment, and tools supplied by Competitors

The following items are allowed to be carried in the toolbox:

Description	Photo
Pens pencils, Eraser and highlighters	 
Set squares	

Description	Photo
Straight edges	 
Trammel Points	
Digital marking gauge	 
Angle finder / protractor	 
Digital calliper / height measurement tool.	
Tape Measure	
Steel rulers 150 - 2000	
Compass	
Sliding bevels	
Marking gauges	 

Description	Photo
Calculator	
Try Square and Roofing Square	  
Hand Saws	   
Planes - metal or wood	   
Chisels	
Mallet	 
Claw Hammer	

Description	Photo
Utility Knife	 
Nail Punch	
Allen Key Set	
Screw drivers	
Clamps	   
Plunge Saw and guide rails	
Jig Saw	
Router	
Router bits	

Description	Photo
Planer	
Sander with Sandpaper	
Drill bits metal and wood	 
Cable Reel	 
Knee pads	
Ear Defenders Safety Glasses	 
Vice	  

The list above is not exclusive.

Furthermore, Competitors are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements

8.4 Materials, equipment, and tools supplied by Experts

Experts are not required to bring materials, equipment, or tools. All is supplied by the Competition Organizer.

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements .

8.5 Materials and equipment prohibited in the skill area

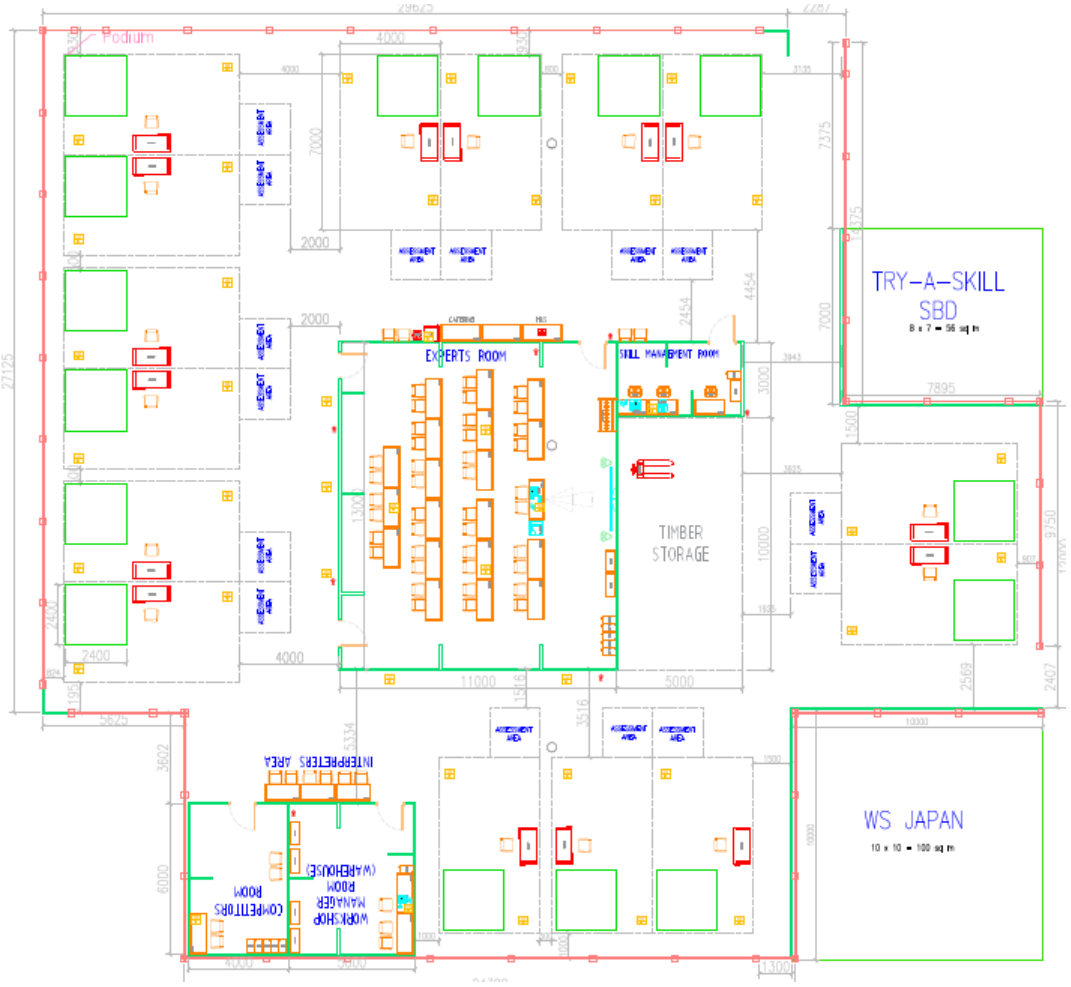
Competitors and Experts are prohibited to bring any materials or equipment not listed in section 8.3 and section 8.4.

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



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 workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

Topic/task	Skill-specific rules
Use of technology – USB, memory sticks	• Competitors are not allowed to bring or use personal memory sticks into the workshop. If these items are brought into the workshop they must be locked in the personal locker and not removed until the end of competition on C4. • Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, and Interpreters are allowed to bring and use memory sticks into the workshop.

Use of Use of technology – personal laptops, tablets, mobile phones, and photo taking devices	• Competitors are not allowed to bring personal laptops, tablets, or mobile phones into the workshop. If these items are brought into the workshop, they must be locked in the personal locker but can be removed at lunch time and at the end of the day.
	• Competitors are allowed to take photos on C4 only
	• Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, and Interpreters are allowed to bring personal laptops, tablets or mobile phones into the workshop.
	• Chief Expert, Deputy Chief Expert, 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 C1.
	• Experts are not allowed to take pictures of any document of the Test Project from C-5 to C3.
	• Any violation will cause following sanction for the particular person:
	  • the devices will be locked away by the Skill Management Team until the end of C4.
	  • other penalties will follow the issue resolution process of WorldSkills international

Drawings, recording information	• Competitors must return all drawings, instructions, and documents produced by themselves to the Chief Expert to be stored in a locked cabinet at the end of each competition day • All documents must be rolled together, named with the Competitors number and given to the CE immediately after finishing working time. • All drawings and Test Project papers can be taken at the end of Competition on C4.

Topic/task	Skill-specific rules
Listening to music	• Competitors are allowed to listen to music using personal earphones during the completion of the project; except when using power tools. • Only MP3 players are allowed, mobile telephones or any Wi-Fi enabled devices are prohibited.
Test Project - finishing	• No bevelling or sanding of any parts of the Test Project (for Marking reasons), every violation will be penalized like a recut. • Marks and pencil marks maybe removed by eraser

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

This skill competition will focus on the sustainable practices below:

- Recycling bins are 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 and transport box size restricted to a maximum internal volume of 1.5 m^3;
- The finished Test Project is reusable after the competition

12 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 7115
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.**onet**online.org/)

This WSOS (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 Occupational Standards in place for WorldSkills Shanghai 2022.

Organization	Contact name
Aannemersbedrijt Koningstijl (Netherlands)	Bouke Koopman, Director
Berufsschule Lenzburg (Switzerland)	Michael Huerbin, Teacher
Holzbau Schweiz (Switzerland)	Peter Elsasser, Business Unit Manager Education
PCL Constructors (North America)	Randy Callaghan, Workforce Supervisor