



TECHNICAL DESCRIPTION **CARPENTRY**



WorldSkills International, by a resolution of the Technical 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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Effective 12.08.14

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

The carpenter works internally and externally, including in the homes of customers and on building sites in all weather conditions. He or she will interpret drawings, set out and measure, cut, form joints, assemble, install and finish to a high standard.

The carpenter's work includes:

- Measuring, cutting and installing components of a residence or commercial building including floor, wall and roof systems. It can also include stairs, interior and exterior finishes, roofing materials, doors, windows and other finishing components. Accurately measuring and cutting enables greater quality for items like trim and moulding which must be finished with great precision
- Constructing forms for concrete, wall and roof systems of the structures
- Installing components that are seen on the inside and outside of residential or commercial buildings such as sidings, shutters, roofing materials, as well as out-buildings such as garages, sheds, gazebos, pergolas and play houses.

Work organization and self-management, communication and interpersonal skills, problem solving, innovation and creativity, and working precisely and accurately, are the universal attributes of the 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 are largely irreversible and have a very high cost. This means that the carpenter must work safely and tidily, have stamina, demonstrate exceptional planning and organization skills, concentrate and pay attention to detail in order to achieve an excellent finish.

With the international mobility of people, the carpenter faces rapidly expanding opportunities and challenges. For the 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. Training normally includes using hand and power tools; doing rough and finish carpentry work; learning how more intricate jobs are completed, and the importance of accuracy.



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 (when available)
- WSI – Online resources as indicated in this document
- Host Country – Health and Safety 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 not be separate tests of knowledge and understanding.

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. 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	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• Health and safety legislation, obligations, regulations and documentation• The situations when personal protective equipment (PPE) must be used• The purposes, uses, care, maintenance and storage of tools/equipment safe handling implications• The purposes, uses care and storage of materials and safe handling implications• The significance of keeping a clean and tidy work area• Sustainable methods and materials in construction work• 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"> • Follow health and safety standards, rules and regulations • Maintain a safe working environment • Identify and use the appropriate personal protective equipment including safety footwear, ear, eye and dust protection • Select, use, clean, maintain and store all hand and powered tools and equipment safely, following manufacturers' instructions • Select, use and store all materials safely • Plan the work area to maximize efficiency and maintain the discipline of regular tidying and cleaning • Measure accurately and avoid wastage 	
2	Business, communication and interpersonal skills	5
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • Non-verbal communication such as drawings and specifications • The roles and requirements of architects and related trades and the most effective methods of communication 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Estimate quantities required • Respond positively to any feedback from colleagues, managers and customers and take any necessary actions 	
3	Problem solving, innovation and creativity (10%)	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The common types of problem which can occur within the work process e.g. timber defects • Diagnostic approaches to problem solving • Trends and developments in the industry e.g. energy efficiency 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Check work regularly, particularly for accuracy and standard • Recognize and understand problems swiftly and follow a self-managed process for resolving them • Challenge incorrect information to prevent problems • Keep up to date with changes in the industry 	
4	Reading and interpreting drawings and written instructions	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The relationships between parts of the project • How to interpret views and projections • Geometry, trigonometry and triangulation • Mathematical processes and problem solving • The acceptable tolerances for tasks and project 	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Accurately interpret views and projections; orthographic, auxiliary and isometric projections, 3D views and sectional details • Determine from drawings how parts intersect and are joined together • Identify drawing errors or items that require clarification • Determine and check quantities of materials required to build specified projects 	
5	Setting out and measuring	10
	<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 the project • The implications for the business/organization of not setting out correctly • Calculations to assist in measurement and checking of work • Different types of complex joints including mitres, scribes, scarf joints, tongue and groove, shiplap, birdsmouth, plumb cuts, seat cuts and lip cuts to purlins and jack rafters 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Visualize and think through the work identifying potential challenges early and taking the necessary preventative action • Set out the project neatly and accurately • Set out the members necessary to determine all the measurements, sections, angles, mitres and joints • Use geometric methods to determine complex angles, joints and intersections • Set out standard carpentry joints: butt, housing, mortise and tenon, halving, draw bore and pinned, birdsmouth joints for rafters and lip cuts • Label all members and joints • Transfer points, measurements and angles accurately from setting out board to timber • Set out directly on timber where appropriate • Set out joints on timber using set-squares, bevels and gauges • Indicate bevels, mouldings and other features • Clearly label waste material 	
6	Forming joints and preparing members for assembly	20
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The range of materials: wood, metal and plastic • Characteristics of timber, timber-based manufactured boards and materials • Different types of complex joints including mitres, scribes, scarf joints, tongue and groove, shiplap, birdsmouth, plumb cuts, seat cuts and lip cuts to purlins and jack rafters • The use of fixing devices such as nails, screws, angle brackets, framing anchors, joist hangers, toggle/expansion bolts, truss clips and toothed plates for bolted trusses 	



	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Safely use hand and machine cutting tools to remove waste including: chop and bench saws, router and drills• Cut materials accurately with clean lines• Form neat, accurate joints to meet the drawing specifications	
7	Assembling and fastening all components of the structure (erection)	20
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• How pilot holes, counter sink and fastenings can be used effectively	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Fix joints accurately and securely using screws and nails• Use other fixing devices as specified such as bolts, plates, brackets, hinges and dowels	
8	Finishing	20
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none">• The importance of finishing in line with the specification provided	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none">• Assemble joints with no gaps• Assemble product with a high degree of accuracy• Produce flat faces to backing bevels and chamfers• Install fixings neatly• Present the work with a minimum of pencil marks, stains and other imperfections• Organize any waste material in the correct way to enable safe disposal or recycling	



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 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 judgment. These are referred to as **objective** and **subjective**, respectively. 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 agreed by the Experts and 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 external designer for the development of the Marking Scheme and Test Project.

In addition, Experts are encouraged 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 the complete and approved 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 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).

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 of assessment 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) has a specified day on which it will be marked.

Each marking form (Sub Criterion) contains either objective or subjective Aspects to be marked. Some Sub Criteria have both objective and subjective aspects, in which case there is a marking form for each.

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 objectively or subjectively and appear on the appropriate marking form.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it and a reference to the section of the skill as set out in the Standards Specification.

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
STANDARD SPECIFICATION SECTIONS										
TOTAL MARKS PER CRITERION										100

SAMPLE OF TABLE FROM CIS



4.5 SUBJECTIVE MARKING

Subjective marking uses the 10 point scale below. To apply the scale with rigour and consistency, subjective marking should be conducted using:

- benchmarks (criteria) to guide judgment against each Aspect
- the scale to indicate:
 - 0: non attempt;
 - 1-4: below industry standard;
 - 5-8: at or above industry standard;
 - 9-10: excellence.

4.6 OBJECTIVE MARKING

A minimum of three experts will be used to judge each aspect. Unless otherwise stated only the maximum mark or zero will be awarded. Where they are used, partial marks will be clearly defined within the Aspect.

4.7 THE USE OF OBJECTIVE AND SUBJECTIVE ASSESSMENT

The final deployment of objective or subjective assessment will be agreed when the Marking Scheme and Test Project are finalized. The table below is advisory only for the development of the Test Project and Marking Scheme.

SECTION	CRITERION	MARKS		
		Subjective	Objective	Total
A	Interior joints	10	0	10
B	Dimensions	0	50	50
C	Exterior joints	0	25	25
D	Neatness of finish, cleanness	10	0	10
E	Deductions*	0	5	5
Total		20	80	100



4.8 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

A - Interior joints

- Cut accurately to lines;
- Form joints neatly;
- Produce clean, accurate cuts.

B – Dimensions

- Cut and assemble members to a high degree of accuracy.

C - Exterior joints

- Form joints with no gaps.

D - Neatness of finish, cleanness and general impression

- Flat faces;
- Tight joints;
- No missing pieces;
- Neat fixings;
- Minimum pencil marks and stains.

E - Deductions

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

4.9 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;
- All Experts assess a similar percentage of the overall marks;
- 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 Experts will decide which dimensions will be measured.

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 points on the CIS.

TIME	ACTIVITY
+/- 0 – 1 mm	100% points
+/- 1 – 2 mm	90% points
+/- 2 – 3 mm	80% points
+/- 3 – 4 mm	70% points
+/- 4 – 5 mm	60% points
+/- 5 – 6 mm	50% points
+/- 6 – 7 mm	40% points
+/- 7 – 8 mm	30% points
+/- 8 – 9 mm	20% points
> +/-9mm	10% points

C - Exterior joints

Experts decide which groups of joints to assess and identify on drawing.

The biggest gap in each cluster of joints is measured.

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

TIME	ACTIVITY
Less than < 0.5	100% points
Less than < 1.0	80% points
Less than < 1.5	60% points
Less than < 2.0	50% points
Less than < 2.5	40% points
Less than < 3.0	30% points
Less than < 3.5	20% points
Equal or more than ≥ 3.5	10% points

D - Neatness of finish, cleanness and general impression

Experts judge the overall finished project on a scale of 1-10 for neatness of finish, cleanness and general impression.



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 points
- New pieces - 2.50 points



5 THE TEST PROJECT

5.1 GENERAL NOTES

Sections three and four 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 and balanced 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.

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 0 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:

- Forms for concrete;
- 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 100cm² and timber-based manufactured boards and materials where appropriate.

One module should be designed so that it can be prepared and assembled by hand tools.



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 7.2, typically no more than eight cubic metres. It must be capable of being re-used or recycled.

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

Proposals must include the following documents:

- Plan supplied as .dwg file using the template on the above link;
- Test Project specification supplied as a Word file using the template on the above link;
- A material list;
- A cutting list;
- A photograph or 3D drawing as proof that the Test Project is able to be completed.

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 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 external designer, without a Competitor or vested interest in the competition, completes the drawings for the Test Project and publishes them on the WSI Carpentry forum.

The following documents should be included:

- Drawings with front, side and top view including the main measurements and joints.
- 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 construction details or a 3D CAD drawing with construction details.



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:

Not circulated.

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

Chief Expert and Deputy Chief Expert and external designer.

The Experts can decide to make minor changes at C-4 like taking out a piece or putting in one more within the constraints of the materials list.

5.9 TEST PROJECT CHANGE AT THE COMPETITION

The external designer makes a 30% change to the project and keeps it confidential until C-4.

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 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
- Marking Schemes
- Test Projects
- Infrastructure List
- Health and Safety documentation
- 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 Chief Expert. The Skill Management Team comprises the Jury President, 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 Host Country/Region Health and Safety documentation for Host Country/Region regulations.

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

- All Competitors must use safety glasses when using any hand, power or machine tools/equipment 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.



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 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 Experts must review and update the Infrastructure List in preparation for the next Competition. Experts must advise the Technical Director 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 MATERIALS, EQUIPMENT AND TOOLS SUPPLIED BY COMPETITORS IN THEIR TOOLBOX

Competitors may bring a toolbox with regular Carpenter's tools and equipment to enable them to construct the Test Project to full size. Tool boxes must be kept to minimal size to lessen the environmental footprint.

8.3 MATERIALS, EQUIPMENT AND TOOLS SUPPLIED BY EXPERTS

Not applicable, if supplied by Competition Organizer, they will be posted on the Infrastructure List with name, type and model of tool.

8.4 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

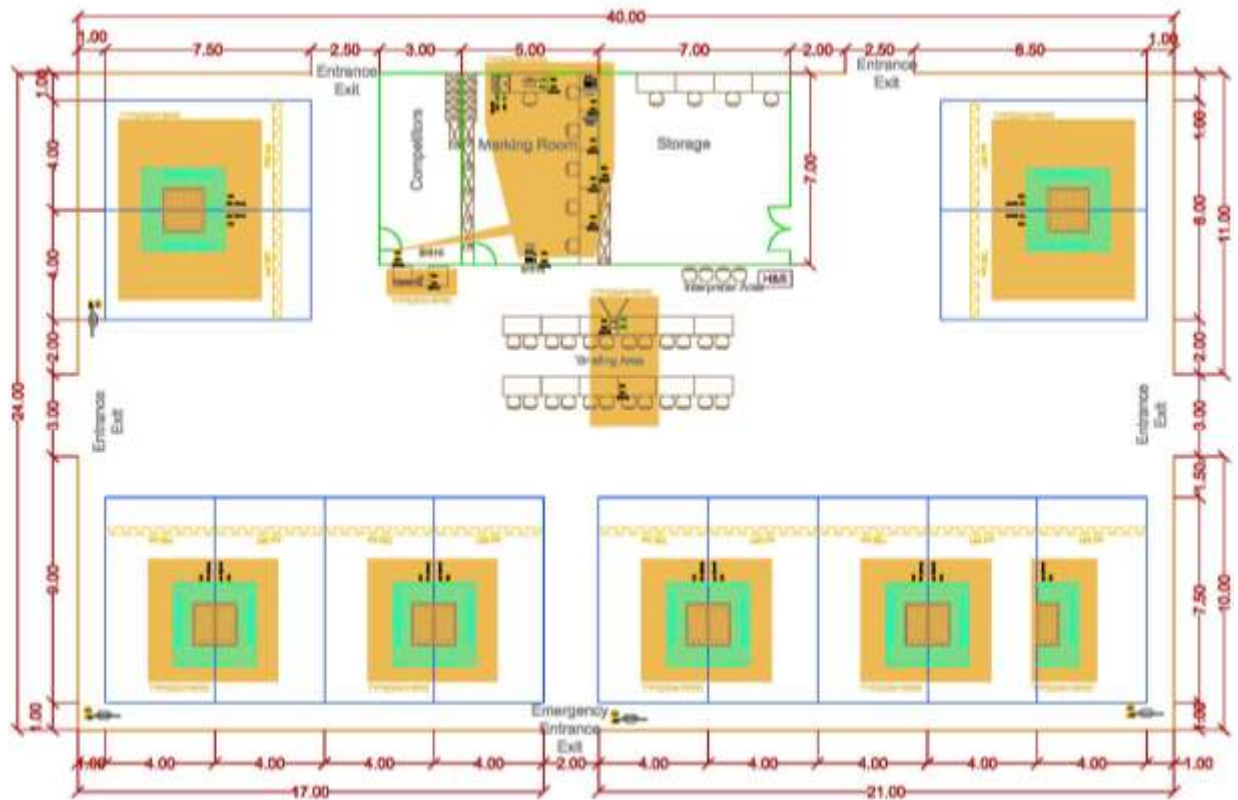
Equipment or tools that are not safe or do not meet the hosts' safety codes.



8.5 PROPOSED WORKSHOP AND WORKSTATION LAYOUTS

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

Example workshop layout:





9 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.



10 SUSTAINABILITY

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

- Recycling bins will be provided for paper, cans and bottles;
- Use of recycled paper for printing of Competition documents;
- Wood used in the Competition projects is harvested from sustainable sources;

The finished Test Project will be reusable after the competition.