



TECHNICAL DESCRIPTION
Carpentry



world **skills**
international

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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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Technical Committee Chair

1. INTRODUCTION

1.1 Name and description of skill

1.1.1 The name of the skill is [Carpentry](#).

1.1.2 Description of skill

[Carpentry](#) covers measuring, cutting, and installing elements of a home or building. These can include trim, stairs, siding, roofing, and custom cabinets.

A carpenter builds the frame of the building structure, along with the exterior walls. Cutting and with precision tools accurately enables greater detail for items like trim and molding which must be finished accurately and with great precision.

Sometimes a finish carpenter will perform both rough and finish work in the same job. This can be more convenient for him because if a separate rough carpenter doesn't install the walls or flooring perfectly accurate, he will have a hard time making up for those mistakes while installing the trim. By doing both jobs, he ensures that everything is measured and cut properly.

A carpenter will get his training working as an apprentice for a more experienced professional. He will likely be required to use hand tools, do rough carpentry work, and observe closely how the more intricate jobs are done. An experienced finish carpenter can make a very good income once he has been properly trained.

In some cases a finish carpenter will also do installations for components that will be seen on the outside of the home. This can include siding and roofing materials, gazebos, pergolas and play houses.

1.2 Scope of application

1.2.1 Every Expert and Competitor must know this Technical Description.

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

1.3 Associated documents

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

- WSI - Competition Rules
- WSI - Competition Manual
- WSI - Online resources as indicated in this document
- Host Country - Health and Safety regulations

2. COMPETENCY AND SCOPE OF WORK

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only.

2.1 Competency specification

Reading and interpreting drawings and written instructions

Knowledge and understanding:

- Understand the relationships between parts of the project.
- Understand and interpret views and projections.
 - Orthographic projection
 - Auxiliary projection
 - Isometric projection
 - 3D views
 - Sectional details

Competitors shall be able to:

- Determine from the drawings how parts intersect and are joined together.

Planning and setting out

Competitors shall be able to:

- 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 joints,
 - Housing joints,
 - Mortise and tenon joints
 - Halving joints
 - Bird's mouth joints for rafters.
 - Lip cuts
 - Draw bore and pinned joints
- Label all members and joints.

Marking measurements and angles on timber

Competitors shall be able to:

- Label all members
- Transfer points, measurements and angles accurately from setting out board to timber.
- Set out directly on to timber where appropriate.
- Set out joints on timber using set-squares, bevels and gauges.
- Indicate clearly waste material.
- Indicate bevels, mouldings and other features.

Forming joints and preparing members for assembly

Competitors shall be able to:

- Use hand cutting tools to remove waste.
- Use machine cutting tools to remove waste.
 - Chop saw
 - Router
 - Bench saw
 - Drills
- Form cuts using saw only, cutting accurately to lines with clean, accurate cuts.
- Form neat internal joints for housings, halving and mortises.
- Prepare one specified module using hand tools only.

Assembling and fastening all components of the structure (erection)

Knowledge and understanding:

- Understand how pilot holes, counter sink and draw-boring can be used effectively.

Competitors shall be able to:

- Fix joints accurately and securely using screws and nails.
- Use other fixing devices as specified such as bolts, plates, brackets, hinges and dowels.

Produce a neat finish

Competitors shall be able to:

- Assemble joints with no gaps.
- Produce flat faces to backing bevels and chamfers.
- Install fixings neatly.
- Present the project with a minimum of pencil marks, stains and other imperfections.

2.2 Theoretical knowledge

2.2.1 Theoretical knowledge is required but not tested explicitly.

Competitors will require a wide range of theoretical knowledge to adequately demonstrate their practical skills during the competition:

- Interpretation and application of sketches and details
- Geometrical knowledge for calculating measurements and angles
- Knowledge of materials, fixings and building processes
- Project planning
- Safe work methods
- Time allocation
- The order of processes

2.2.2 Knowledge of rules and regulations is not examined.

2.3 Practical work

The Competitor has to carry out the following task:

- Draw sufficient details of the project to determine the length, shape angles and joints for each member.
- Mark out the members accurately.
- Prepare the materials by cutting to length, forming bevels and forming joints.
- Assemble the project using nails and screws.

3. THE TEST PROJECT

3.1 Format / structure of the Test Project

The format of the Test Project is a single TP with separately assessed modules.

3.2 Test Project design requirements

The Test Project must incorporate wooden structures such as walls, floors, roofs and finishing components. It should reflect the type of work carried out by a Carpenter.

It is produced from planed timber with section sizes generally up to 90mm x 90mm and should be designed with complex intersections and joints to challenge the Competitor.

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

Test Project should be submitted using the WSI templates which can be downloaded from the following link:

http://www.worldskills.org/index.php?option=com_content&task=view&id=243&Itemid=340

Proposals must include the following documents:

- Plan supplied as dwg file using the template on the above link
- Test Project 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

3.3 Test Project development

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.

3.3.1 Who develops the Test Project / modules

The Test Project/modules are developed by [some Experts](#).

3.3.2 How and where is the Test Project / modules developed

The Test Project/modules are developed [independently](#).

3.3.3 When is the Test Project developed

The Test Project/modules are developed [by 6 months before the current Competition](#). [Experts submit their proposed Test Projects as a 3D drawing to the forum. The drawing will give a basic impression of the fully assembled Test Project with no dimensions.](#)

3.4 Test Project marking scheme

Each Test Project must be accompanied by a marking scheme proposal based on the assessment criteria defined in Section 5.

3.4.1 The marking scheme proposal is developed by the person(s) developing the Test Project. The detailed and final marking scheme is developed and agreed by all Experts at the Competition.

3.4.2 Marking schemes should be entered into the CIS prior to the Competition.

3.5 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:](#)

- [Photograph of the completed Test Project with construction details](#)
- [3-D CAD drawing with construction details](#)

3.6 Test Project selection

The Test Project is selected as follows:

[The Test Project is selected by vote of Experts on the forum.](#)

[The Experts may make modifications to the proposed project.](#)

3.7 Test Project circulation

The Test Project is circulated via WorldSkills International website [3 months before the current Competition](#).

3.8 Test Project coordination (preparation for Competition)

Coordination of the Test Project will be undertaken by [the Experts](#).

3.9 Test Project change at the Competition

[30% change is agreed and implemented by the Experts at the Competition. Changes can be made to dimensions, shape and layout of the project.](#)

3.10 Material or manufacturer specifications

[Not applicable.](#)

4. SKILL MANAGEMENT AND COMMUNICATION

4.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration and decision making regarding the skill must take place on the skill-specific Discussion Forum (<http://www.worldskills.org/forums>). All 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 moderator for this forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

4.2 Competitor information

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

This information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Other Competition-related information

4.3 Test Projects

Circulated Test Projects will be available from [worldskills.org](http://www.worldskills.org) (<http://www.worldskills.org/testprojects>) and the Competitor Centre (<http://www.worldskills.org/competitorcentre>).

4.4 Day-to-day management

The day-to-day management 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 finalised at the Competition (agreed by Experts and submitted to the Chair/Vice Chair of the Technical Committee). The Chief Expert is to regularly share updates of the Skill Management Plan via the Forum.

5. ASSESSMENT

This section describes how the Experts will assess the Test Project / modules. It also specifies the assessment specifications and procedures and requirements for marking.

5.1 Assessment criteria

This section defines the assessment criteria and the number of marks (subjective and objective) awarded. The total number of marks for all assessment criteria must be 100.

Section	Criterion	Marks		
		Subjective (if applicable)	Objective	Total
A	Interior joints	10		10
B	Dimensions		50	50
C	Exterior joints		25	25
D	Neatness of finish, cleanness	10		10
E	Deductions*		5	5
Total =		20	80	100

* See 5.4 F, Deductions below.

5.2 Subjective marking

Scores are awarded on a scale of 1 to 10

5.3 Skill assessment specification

The skill assessment criteria are clear concise aspect specifications which explain exactly how and why a particular mark is awarded.

A - Interior joints

- Form cuts using saw only
- Cut accurately to lines
- Form joints neatly
- Produce clean, accurate cuts
- Avoid re-cutting or touching up with plane or chisel

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

5.4 Skill assessment procedures

The Chief Expert divides the Experts into marking teams taking into consideration 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, one primary group and one control group.

+/- 0 – 1 mm	10 points
+/- 1.1 – 2 mm	9 points
+/- 2.1 – 3 mm	8 points
+/- 3.1 – 4 mm	7 points
+/- 4.1 – 5 mm	6 points
+/- 5.1 – 6 mm	5 points
+/- 6.1 – 7 mm	4 points
+/- 7.1 – 8 mm	3 points
+/- 8.1 – 9 mm	2 points
+/- 9.1 – 10 mm	1 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.

Less than < 0.5	10 points
Less than < 1.0	8 points
Less than < 1.5	6 points
Less than < 2.0	5 points
Less than < 2.5	4 points
Less than < 3.0	3 points
More than > 3.5	2 points

D - Neatness of finish, cleanness and general impression

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

E - Deductions

Up to their deduction credit, Competitors may request

- Permission to recut (maximum 4 recuts)
- A new piece of wood (maximum 2 pieces)
- This is to be recorded by the signature of at least two Experts.

The following deductions apply:

- Recuts - 1.25 point
- New pieces - 2.50 points

6. SKILL-SPECIFIC SAFETY REQUIREMENTS

Refer to Host Country Health & Safety documentation for Host Country regulations.

In addition to Host Country Health & Safety requirements the following is also necessary:

- All Competitors must use safety glasses when using any hand, power or machine tools or equipment likely to cause or create chips or fragments that may injure the eyes.
- A first-aid kit must be available throughout the Competition.
- 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.

7. MATERIALS & EQUIPMENT

7.1 Infrastructure List

The Infrastructure List lists all equipment, materials and facilities provided by the Host Country.

The Infrastructure List is online (<http://www.worldskills.org/infrastructure/>).

The Infrastructure List specifies the items & quantities requested by the Experts for the next Competition. The Host Country will progressively update the Infrastructure List specifying the actual quantity, type, brand/model of the items. Host Country supplied items 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.

8. MARKETING THE SKILL TO VISITORS AND MEDIA

8.1 Maximising visitor and media engagement

The following ideas will be considered to maximise visitor and media engagement.

- Display screens
- Test Project descriptions
- Daily reporting of Competition status

8.2 Sustainability

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