TECHNICAL DESCRIPTION

CABINETMAKING

CONSTRUCTION AND BUILDING TECHNOLOGY

TD24 v5.0 — WSC2015

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:

1 INTRODUCTION 2
2 THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS) 4
3 THE ASSESSMENT STRATEGY AND SPECIFICATION 9
4 THE MARKING SCHEME 10
5 THE TEST PROJECT 14
6 SKILL MANAGEMENT AND COMMUNICATION 17
7 SKILL-SPECIFIC SAFETY REQUIREMENTS 18
8 MATERIALS AND EQUIPMENT 19
9 VISITOR AND MEDIA ENGAGEMENT 21
10 SUSTAINABILITY 22
11 APPENDIX 23

Effective 12.08.14

Stefan Praschl
Chair Technical Committee

Michael Fung
Vice Chair Technical Committee

1 INTRODUCTION

1.1 NAME AND DESCRIPTION OF THE SKILL COMPETITION

1.1.1 The name of the skill competition is

Cabinetmaking

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

Cabinetmaking covers the manufacture of free-standing and built-in furniture and units, using wood at the sole or main material. It may include the design of furniture, but normally comprises the creation of furniture and units from designs prepared by others. Cabinetmaking differs from joinery through the quality of the wood and associated materials used, and the intricacy and aesthetic quality of the finished items. There is, however, some overlap between cabinetmaking and joinery.

A cabinetmaker generally works on commercial and residential assignments of a high quality and value. He or she will therefore exhibit very high standards of skill and professionalism in order to justify clients' expectations and willingness to pay. Most cabinetmakers work in small companies which have to be very sensitive to their reputation and market in order to sustain their businesses' viability.

The cabinetmaker will produce furniture and fittings in a workshop, at least until installing fitted items. However, in order to meet clients' needs, including for the items to add to the aesthetic qualities of their environment they will be placed in, he or she will know intimately where bespoke items are intended to be placed. For items produced speculatively rather than for known clients, the cabinetmaker will have a clear view of the types of location and setting that will show the items at their best.

The cabinetmaker will produce, interpret and/or adapt drawings, set out and measure, cut, form joints, assemble, install if need be, and finish to a high standard. The quality of his/her work will show in:

- The selection of the wood and other materials
- The placing of the wood to bring out its particular characteristics
- Construction techniques which allow for the natural movement of timber to achieve longevity and quality in the furniture piece
- The selection of additional materials including veneers and fittings
- The near-perfect fit of each part following accurate measurement, cutting and assembly, and
- The final appearance of the item

Work organization and self-management, communication and interpersonal skills, problem solving, innovation and creativity, working precisely and accurately are the universal attributes of the cabinetmaker. He or she assumes a high level of personal responsibility and autonomy. From working safely through to exceptional planning and organizing, accuracy, concentration and attention to detail to achieve an excellent finish every step in the process matters and mistakes are largely irreversible and very costly.

Modern technology and mass production have enabled furniture and fittings, previously available only to the wealthy, to be more widely available. However, for those with disposable income and an eye for quality, the cabinetmaker is able to produce furniture and fittings that are a lasting pleasure both to use and to look at. In this discerning market the outstanding cabinetmaker will always be in demand.

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**	**10**
	The individual needs to know and understand: • Health and safety legislation, obligations and regulations which control the work process • The principles of working safely with electrical equipment and tools • Emergency procedures and reporting processes for accidents, first-aid and fire • The situations when personal protective equipment (PPE) must be used • The uses, care, maintenance and storage of tools, machines, equipment and materials • The significance of keeping a clean and tidy work area • Ways in which working practices can minimize wastage and manage/control costs • Sustainability measures applying to the use of 'green' materials and recycling • Principles of work planning, operations and time management • The significance of planning, accuracy, checking and attention to detail in all working practices • The role of the individual in maintaining a successful business • The value of managing own continuing professional development	
	The individual shall be able to: • 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 • Select, use and store all materials safely • Plan the work area to maximize efficiency and maintain the discipline of regular tidying and cleaning • Plan and work efficiently, checking progress and outcomes regularly to avoid unnecessary costs or other penalties • Critically evaluate own work	

2	**Communication and interpersonal skills**	**5**
	The individual needs to know and understand: • The importance of establishing and maintaining client confidence and trust • Non-verbal communication • The negotiation process • The roles and requirements of associated trades and professions • Effective methods of communication with different groups and individuals • The value of building and maintaining productive working relationships with colleagues and managers • The importance of swiftly resolving misunderstandings and conflicting demands • Progress reporting methods	
	The individual shall be able to: • Gain the trust of clients and manage expectations positively • Visualize and interpret clients' wishes, giving advice and making recommendations or providing options which meet/improve their design and budgetary requirements • Liaise with suppliers to negotiate prices and place orders • Produce estimates for clients • Recognize, respect and adapt to changing circumstances and requirements • Communicate with others with reference to drawings, variations to documents and restrictions • Follow instructions, meet deadlines and report on progress in the appropriate format	
3	**Problem solving, innovation and creativity**	**5**
	The individual needs to know and understand: • Principles of style, form and aesthetics • The available options for enhancing quality through style and technique • The common types of problem which occur during the work process • Diagnostic approaches to problem solving • The challenges of complex projects • Trends and developments in the industry	
	The individual shall be able to: • Consider, explore and discuss style, form and aesthetics with clients and specialists • Check work regularly to minimize problems at a later stage • Recognize, clarify and resolve problems swiftly and through appropriate processes • Develop creative solutions to challenges when working on complex projects • Contribute ideas to improve the product and overall level of client satisfaction • Keep up to date with changes and trends in the industry • Demonstrate a willingness to try new methods	

4	Working with drawings	15
	The individual needs to know and understand: • The essential information that should be included in a working drawing • The ISO standards which govern drawings • Geometry and trigonometry • The significance of an accurate working drawing as a basis for high quality work • The importance of identifying and correcting errors and omissions • The options for adding value through construction style and technique	
	The individual shall be able to: • Establish the required uses and environment of the finished product • Establish the required or appropriate materials for the product • Establish the dimensions, characteristics and style of the required product • Produce drawings both to scale and full size [the TD seems to suggest this • Produce drawings which clearly indicate the type of construction • Interpret given drawings, optimizing the potential for high quality construction • Clarify and correct missing or incorrect information • Determine the types and quantities of the required materials for the product	
5	**Selecting and preparing materials**	**25**
	The individual needs to know and understand: • The importance of thinking through each project to ensure that everything is in place to enable completion • The implications for the business/organization of not setting out correctly • Calculations to assist accuracy and the efficient use of time and materials • The characteristics and uses of hardwood and softwood • The characteristics and uses of board materials • The characteristics and uses of veneers • Methods for identifying defects and limitations in the materials selected • The characteristics of the selected material when in use by the client • The basis for selecting fittings for hinges, locks, catches, stays, handles and shelves	
	The individual shall be able to: • Visualize the whole project to identify and resolve challenges • Select the material in order to avoid defects and enhance appearance • Select fittings for use and appearance • Set out the material in order to determine all the measurements, sections, angles, mitres and joints • Use geometric methods to determine complex angles, joints and intersections • Label material and items as appropriate • Transfer points, measurements and angles accurately from plan to materials • Set out directly on materials where appropriate	

6	Jointing and assembly	25
	The individual needs to know and understand: • How solid wood and board material components are joined to create and assemble items • The balance to be struck between the quality of jointing and the available time • The properties, uses and limitations of glues and other fixing materials	
	The individual shall be able to: • Use prepared solid wood to set out the required type and size of joints for an assembly • Use hand and/or hand-powered tools to cut and prepare a wide range of joints including mortice and tenon, finger joints, mitres, dowel joints, halving joints and dovetail joints • Use woodworking machines to form or part-form joints • Use woodworking machines to form grooves, rebates and mouldings • Cut board materials and prepare joints using a dimension saw • Apply edging strips and face veneers to a panel	
7	**Preparation of surfaces and finishing**	**15**
	The individual needs to know and understand: • How various components are prepared for polishing • The uses and limitations of preparatory techniques and materials • Methods of fitting doors and drawers into a cabinet carcase • The uses and limitations of polishing materials and agents • The importance of checking finish against client requirements and expectations and personal standards	
	The individual shall be able to: • Position and fit hinges • Control the fit around door edges • Fit drawers and other moving items into carcases to achieve a glide fit • Produce surfaces that are free from defects • Produce surfaces on a complete assembly that are free from defects • Produce soft edges to the components or assemblies • Polish the components or assemblies • Review the items for harmony, proportion, fit and finish	

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)

STANDARD SPECIFICATION SECTIONS	CRITERIA									TOTAL MARKS PER SECTION
TOTAL MARKS PER CRITERION										100

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	Dimensions	0	19	19
B	Conforming to drawing	0	11	11
C	Face Marking and Joints before gluing	15	4	19
D	Joints after gluing	18	0	18
E	Fitting and movable parts	7	9	16
F	Surfaces	6	6	12
G	Use of materials	0	5	5
Total		**46**	**54**	**100**

4.8 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

Sections A to G

A Dimensions
Specific dimensions will be measured. All dimensional marking will be done by templates supplied by the Workshop Manager.

B Conforming to drawing
The project must conform to the drawing in all instances.

C Face marking and joints before gluing
Indication of face marking system. The inside of the joints is assessed before gluing, including fit and accuracy. Dowels and biscuits must be inserted in a uniform manner for presentation/marking.

A selected dovetail joint(s) will be made with hand tools only [No electric tools will be permitted].

D Joints after gluing
Inspection of joints at assessment time. The joints should have no gaps and show no evidence of fillings (glue, sawdust, wax, etc.).

E Fitting and movable parts
Hardware fitting to doors, drawers etc. according to drawing and information sheets.

Fit and function of moving parts. Wax or lubricant only allowed on moving parts.

F Surfaces
The quality of finish of all surfaces e.g. solid wood, veneered panels and edges should be ready for polishing. The surfaces should show no evidence of fillings (glue, sawdust, wax, etc.). Surfaces will be prepared to a maximum of 320 sand paper. Surfaces should be level with no visible cross scratches.

G Use of material
A penalty for the use of extra materials due to mistake up to a maximum of five points.

4.9 SKILL ASSESSMENT PROCEDURES

When marking is carried out by a team of Experts, only the allocated team, the Chief Expert and/or the Deputy Chief Expert may be present. Experts not involved in marking are not to be in the marking area.

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 project assessed in stages.

5.3 TEST PROJECT DESIGN REQUIREMENTS

- The drawings for a Test Project proposal must be created in AutoCAD format DWG and also saved as a DXF and PDF file and include the correct specifications. The drawings must be to the scale of 1:1 and the format should be maximum A0.The orthographic drawing can be produced at an identified reduced scale. Test project proposals should be produced considering the need for 30% change;
- Test Project proposals must be in English;
- Test Project proposals must have a carcase, drawer and a hinged component;
- Maximum size of a Test Project is 2500mm (length + height + depth);
- Test Project can be completed in 22 hours.

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

A selected 50% of Experts will submit a Test Project. A new Expert may, but does not have to, deliver a Test Project proposal at their first Competition.

5.4.2 How and where is the Test Project or modules developed

The Test Project/modules are developed independently.

Experts can discuss their Test Project proposals on the Discussion Forum. Each participating Expert submits their Test Project proposal.

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
Before previous Competition	A selected 50% of Experts develop a Test Project proposal
At the previous Competition	All proposals that meet the design requirements are submitted to the Technical Director and are circulated to all Experts on the Discussion Forum
Six (6) months before current Competition	Experts' shortlist three proposals by vote on the Discussion Forum. WorldSkills Technical Director randomly selects one proposal. The selected Test Project is provided confidentially to a past Expert to prepare the 30% change
Three (3) months before current Competition	The past Expert makes 30% change and keeps change secret. The past Expert provides only the bill of material to the Workshop Manager to prepare the materials. See TD Appendix for 30% change Expert responsibility
Six (6) weeks before the Competition.	See TD Appendix for 30% Change Expert Responsibility
At the Competition	Experts see the 30% change. Experts advise Competitors of the 30% change

5.5 TEST PROJECT VALIDATION

The Test Project is validated by a photograph of the completed project.

5.6 TEST PROJECT SELECTION

See timeline 5.4.3.

5.7 TEST PROJECT CIRCULATION

The Test Project is circulated via the website as follows:

The three shortlisted Test Projects are circulated six months before the current Competition (see 5.4.3 above).

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

Coordination of the Test Project will be undertaken by the Chief Expert and Deputy Chief Expert.

5.9 TEST PROJECT CHANGE AT THE COMPETITION

See timeline 5.4.3.

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.

Not applicable.

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.

- The Workshop Manager is responsible for the safety measures on the machines, including the use of safety glasses and hearing protection;
- All machines should be properly guarded;
- All circular saws must have a riving knife and top guard;
- For all machines wooden safety aids may be requested by Experts;
- Compressed air is not to be used for dust removal;
- Experts are to check safety of all machines and to make a decision 'safe' or 'not safe';
- The light conditions must be uniform for all Competitors and must be a minimum 300 lux at each bench top;
- Each Competitor will have a working area of 15 square meters. Each bench must have a minimum of one vice with wooden chops mounted on the long side;
- The work surface of the bench must be height adjustable.

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 any handheld electric power tools they wish such as drills, sanders, routers, saws, Lamello (biscuit machine) etc. Every power tool that is equipped with an attachment for dust exhaustion should have a dust collector;
- The only two permitted stationary mounted machines the Competitor may bring are one Chop (Drop) saw and one Inverted router table machine;
- If either the Chop (Drop) saw or Inverted router are supplied by the Competition Organizer then they cannot be brought by the Competitor;
- Competitors may not bring cutter blocks or saw blades for the Competition Organizer supplied machinery except for drills;
- Solid timber and practice pieces will be supplied by the Competition Organizer. The Competitor may bring plywood off-cuts only;
- Competitors may bring any hand tools they wish;
- Competitors may bring consumable materials such as paper, adhesive tape, abrasive paper, glue, etc.;
- Competitors may not bring any solid wood, plywood or MDF. This material will be supplied by Competition Organizer.

8.3 MATERIALS, EQUIPMENT AND TOOLS SUPPLIED BY EXPERTS

Personal Protective Equipment (PPE) such as safety glasses and ear protection.

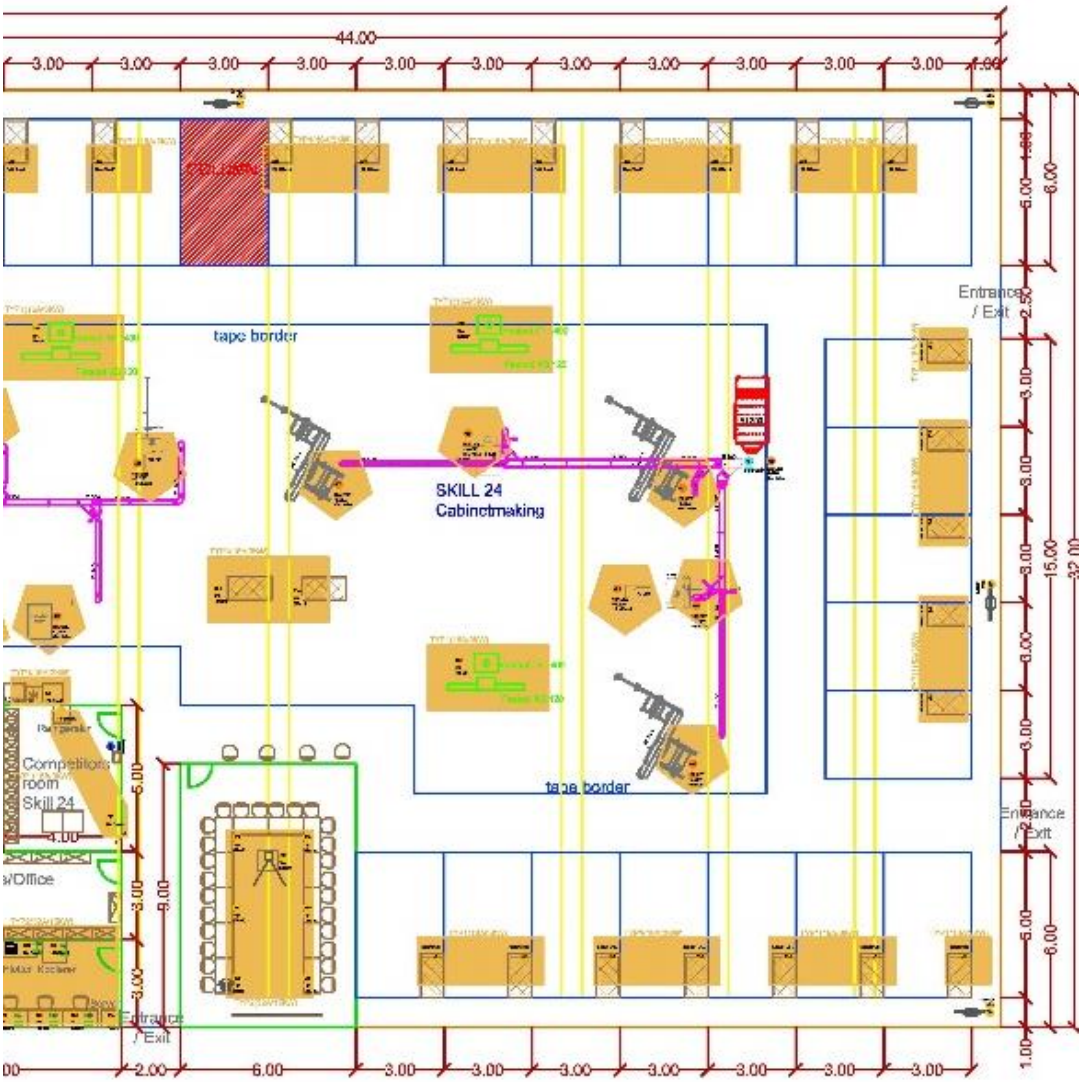
8.4 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

Those not listed in 8.2 above are prohibited in the skill area.

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

It is intended that the following will be used to maximize visitor and media engagement for this skill.

- Try a trade;
- Display screens;
- Test Project display;
- Career opportunities;
- Daily reporting of competition status.

10 SUSTAINABILITY

- Recycling;
- Use of completed Test Projects after Competition;
- If possible certified wood will be used for Test Project;
- If possible project materials should be local to the Competition Organizer.

11 APPENDIX

Technical Description Appendix

30% Change Expert Responsibilities:

- Provide 30% change to Test Project;
- Provide Material List for Test Project;
- Provide Marking Scheme for Test Project;
- Assure Infrastructure List is correct for Test Project:
  - Machines;
  - Power Tools;
  - Shop Supplies;
    - Tooling;
    - Adhesives;
    - Fasteners;
    - Abrasives;
    - Etc.
  - Hardware;
  - Competitor Practice Material;
  - Competitor Template Material.