worldskills Europe

Technical Description

EuroSkills Graz 2020
Electrical Installations (18)

ES2020_TD

Contents

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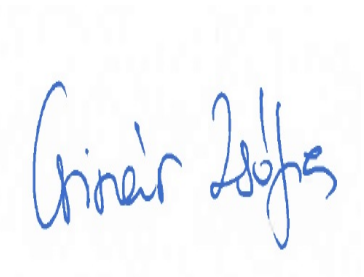
Chair - CC



Ms Szofia Csiszar
Vice Chair - CC

1 Introduction

1.1 Name and description of the Skill Competition

1.1.1 The name of the skills competition is

Electrical Installations

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

An electrician works on commercial, residential, agricultural and industrial projects. There is a direct relationship between the nature and quality of the product required and the payment made by the customer. Therefore the electrician has a continuing responsibility to work professionally in order to meet the requirements of the customer and thus maintain and grow the business. Electrical installation is closely associated with other parts of the construction industry, and with the many products that support it, normally for commercial purposes.

The electrician works internally, including the homes of customers and on small and major projects. He or she will plan and design, select and install, commission, test, report, maintain, fault find and repair systems to a high standard. Work organisation and self-management, communication and interpersonal skills, problem solving, flexibility and a deep body of knowledge are the universal attributes of the outstanding electrician.

Whether the electrician is working alone or in a team the individual takes on a high level of personal responsibility and autonomy. From working to provide a safe and reliable electrical installation and maintenance service, in accordance with relevant standards, through to diagnosing malfunctions, programming and commissioning home and building automation systems, concentration, precision, accuracy and attention to detail every step in the process matters and mistakes are largely irreversible, costly and potentially life threatening.

With the international mobility of people the electrician faces rapidly expanding opportunities and challenges. For the talented electrician there are many commercial and international opportunities; however these carry with them the need to understand and work with diverse cultures and trends. The diversity of skills associated with electrical installations is therefore likely to expand.

1.2 The content, relevance and significance of this document

This document incorporates a Role Description and Standards Specification which follow the principles and some or all of the content of the WorldSkills Standards Specifications. In doing so WSE acknowledges WorldSkills International's (WSI's) copyright. WSE also acknowledges WSI's intellectual property rights regarding 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:

- WSE –Competition Rules
- WSI – WorldSkills Standard Specification framework

- WSE – WorldSkills Europe Assessment Strategy
- WSE – Online resources as referenced in this document
- Host Country – Health and Safety regulations

2 The Standards Specification

2.1 General notes regarding WSSS / WSESS

Where appropriate WSE has utilised some or all of the WorldSkills International Standards Specifications (WSSS) for those skills competitions that naturally align between the two international Competitions. Where the skill is exclusive to the EuroSkills Competition, WorldSkills Europe has developed its own Standards Specification (WSESS) using the same principles and framework to that used for the development of the WSSS. For the purposes of this document the use of the words "Standards Specification" will refer to both WSSS and WSESS.

The Standards Specification 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) *(TBA for WorldSkills Europe)* Helpfully, for the global consultation on the WSSS in 2014, around 50 per cent of responses came from European industry and business.

Each skill competition is intended to reflect international best practice as described by the Standards Specification, 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 Standards Specification

SECTION		RELATIVE IMPORTANCE %
1	**Work organization and self-management**	**10**

The individual needs to know and understand:

- health and safety legislation, obligations and documentation
- the principles of working safely with electricity
- the situations when personal protective equipment must be used
- the purposes, uses, care, maintenance and storage of all tools and equipment together with their safety implications
- the purposes, uses, care and storage of materials
- the importance of keeping a tidy work area
- sustainability measures applying to the use of 'green' materials and recycling
- the ways in which working practices can minimise wastage and help to manage costs whilst maintaining quality
- the principles of work flow and measurement
- the significance of planning, accuracy, checking and attention to detail in all working practices
- impact of new technology

The individual shall be able to:

- follow health and safety standards, rules and regulations
- diligently follow electrical safety procedures
- identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection
- select, use, clean, maintain and store all tools and equipment safely
- select, use and store all materials safely
- identify and take care of expensive fixtures/fittings
- plan the work area to maximise efficiency and maintain the discipline of regular tidying
- measure accurately
- manage time effectively
- work efficiently and check progress and outcomes regularly
- establish and consistently maintain high quality standards and working processes

2	**Communication and Interpersonal Skills**	**10**

SECTION		RELATIVE IMPORTANCE %
	The individual needs to know and understand: • the significance of establishing and maintaining customer confidence and trust • the importance of maintaining and keeping knowledge base up-to-date • the roles and requirements of related trades • the value of building and maintaining productive working relationships • techniques of effective teamwork • the importance of swiftly resolving miss-understandings and conflicting demands	
	The individual shall be able to: • interpret customer requirements and manage customer expectations positively • provide advice and guidance on products/ solutions e.g. technological advancements • visualise and translate customer wishes making recommendations which meet/improve their design and budgetary requirements • question customers closely/deeply to fully understand requirements • provide clear instructions • introduce related trades to support customer requirements • produce written reports for customers and the organisation • produce a cost and time estimate for customers • recognise and adapt to the changing needs of related trades • work effectively as a member of a team	
3	**Problem solving, innovation and creativity**	**10**
	The individual needs to know and understand: • the common types of problem which can occur within the work process • diagnostic approaches to problem solving • trends and developments in the industry including new technology, standards and working methods e.g. 'smart house' and energy saving measures	

SECTION		RELATIVE IMPORTANCE %
	The individual shall be able to: • check work regularly to minimise problems at a later stage • identify problems originating from the work of a related trade e.g. heating pump, ventilation system etc. • challenge incorrect information to prevent problems • recognise and understand problems swiftly and follow a self-managed process for resolving • recognise opportunities to contribute ideas to improve the solution and overall level of customer satisfaction • demonstrate a willingness to try new methods and embrace change e.g. ready- made components	
4	**Planning and design**	**10**
	The individual needs to know and understand: • different types of standards, drawings, installation descriptions and manuals • range of materials and installation techniques to be used in different environments	

	The individual shall be able to:
	• read, interpret and revise drawings and documentation including:
	  • layout and circuit drawings
	  • follow written instructions
	  • plan installation work using drawings and documentation provided
	• to answer some questions about Theoretical knowledge
	  • Technology
	  • Circuit technology
	  • Operational analysis
	• Technical calculation	

5	**Installation**	**40**

SECTION	RELATIVE IMPORTANCE %

The individual needs to know and understand:

- ducting and wiring systems for commercial, domestic, residential agricultural and industrial use and when and where to use a specific ducting and/or wiring system
- the range of electrical switchboards used for commercial, domestic, residential, agricultural and industrial uses and when and where to use a specific switchboard system
- types of electric lighting and heating systems for commercial, domestic residential and industrial use
- control devices and socket outlets used for commercial, domestic, residential, agricultural and industrial uses
- structured cabling systems including: computer network cabling, fire/burglar alarm (conventional and addressable), evacuation control (audio and optical), control and monitoring, access control ('stand-alone' and 'network supervised'), closed circuit television (cameras, lenses and attachment component, recorders and monitors
- Building Automation Systems such as KNX

SECTION		RELATIVE IMPORTANCE %
	The individual shall be able to: • select and install equipment and wire ways as per drawings and documentation provided • install ducting and cabling systems on different surfaces as per manufacturer's instructions and current industrial standards • select and install single and double insulated cables inside ducts, conduits and flexible conduits • install and securely fix double insulated cables onto cable ladder, cable tray and different surfaces as per manufacturer's instructions and current industrial standards • install metal and plastic ducting (trunking): accurately measure and cut duct at specified lengths/ angles; assemble without distortion to joints and to specified tolerances • assemble different termination adaptors, including glands onto duct and attach ducts, of different types, securely onto a surface • install metal and plastic conduits/ flexible conduits and attach securely onto surface, maintaining even radius bends, without distortion to conduit • correct termination adaptors used for entry of conduits into boxes, boards and ducts • install and securely attach different types of cable ladder and cable tray to a surface • install electrical switchboards onto a surface in a secure way and assemble switchboard apparatus in a switchboard as per layout drawings/instructions to include: main switches, RCDs, MCBs, fuses, controlling equipment such as relays and timers and home and building automation devices • terminate and install wiring inside a switchboard according to circuit drawings • connect equipment as per instructions provided to include: structured cabling systems as per manufacturer's instructions and current industrial standards and regulations • programming KNX Systems with devices like dimmactuator, blindactuator, roomcontrolling, movedetector.display, on/off actuator, different type of sensor.	
6	**Testing, reporting and commissioning**	**20**

SECTION	RELATIVE IMPORTANCE %
The individual needs to know and understand: • industrial regulations and standards applicable to different types of installations • verification standards, methods and reports to be used to record verification results • types of measuring instruments • tools and software used for parameterization, programming and commissioning the correct operation of the electrical installation in accordance with the planned specification and customer requirements	
Total	**100%**

3 The assessment approach & principles

3.1 General guidance

Note: this Section and Section 4 summarize a great deal of new information and guidance regarding assessment. Please refer to the Competition Rules for greater detail.

The Competition Development Committee (CDC) establishes the principles and techniques to which assessment at the EuroSkills Competition must conform.

Expert assessment practice lies at the heart of the EuroSkills 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 EuroSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the EuroSkills Competition falls into two broad types: measurement and judgement. Where the earlier terms "objective" and "subjective" still occur, these must be understood to mean measurement and judgement for all procedural and practical purposes. All assessment will be governed by explicit benchmarks, referenced to best practice in industry and business.

The Marking Scheme must include these benchmarks and 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 Technical Description and the principles for assessment as set out in the WSE Assessment Strategy. They will be agreed by the Experts and submitted to WSE for approval together, in order to demonstrate their quality and conformity with the Standard Specification.

Prior to submission for approval to WSE, the Marking Scheme and Test Project will be reviewed by the WSE 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 EuroSkills Competition, in that it ties assessment to the standards that represent the skills to be tested. 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 Standard 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 EuroSkills marking form.

Each marking form (Sub Criterion) has a specified day on which it will be marked.

Each marking form (Sub Criterion) contains Aspects to be assessed and marked by measurement or judgement. Some Sub Criteria have assessment by both measurement and judgement, in which case there is a separate marking form for each method

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked together with the marks, or instructions for how the marks are to be awarded. Aspects are assessed either by measurement or judgement 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, the benchmarks, and a reference to the section of 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 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
		A	B	C	D	E	F	G	H	I	
	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
											100

4.5 Assessment and marking by judgement

In addition to measurement, Experts are expected to make professional judgements. These are normally judgements about quality. Benchmarks will be designed, agreed and recorded during the design and finalization of the Marking Scheme and Test Project in order to steer and support these judgements.

Marking through judgement uses the following scale:

- 0: performance below industry standard to any extent, including a non-attempt
- 1: performance that meets industry standard
- 2: performance that both meets industry standard and surpasses that standard to some extent
- 3: excellent or outstanding performance relative to industry standards and expectations.

4.6 Assessment and marking by measurement

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 Assessment overview

For both measurement and judgement there will be three Experts in the assessment team.

Good practice in assessment comprises measurement and judgement applied both specifically and broadly. The final proportions of measurement and judgment, whether specific or broad, will be determined by the standards, their weightings and the nature of the Test Project.

4.8 Completion of skill assessment specification

This section defines the assessment criteria and the number of marks (judgement and measurement) awarded. The total number of marks for all assessment criteria must be 100. The content of this Table is advisory only and can be adapted as required.

Section	Criterion	Marks		
		Judgement (if applicable)	**Measurement**	**Total**
A	Installing & Connecting	10	30	**40**
B	Commissioning & Testing	2	12	**14**
C	Programming & Commissioning Bus Systems (Functions)	0	30	**30**
D	Theoretical Test	0	8	**8**
E	Health & Safety	0	8	**8**

Section	Criterion	Marks		
	Total =	0	100	100

4.9 Skill assessment procedures

The Chief Expert divides the Experts of the Jury in such way that 3 Experts must be assigned to assess each Aspect of a Sub Criterion. Each marking group must mark the same Aspects of a Sub Criterion for every Competitor to ensure standardisation of marking. Each marking group should, where possible, mark a similar number of Aspects of a Sub Criterion.

The marking groups will be organised so that Experts do not mark their compatriot Competitors.

Exception:

Compatriot marking will only be allowed with the approval of the Chair of the Competition Development Committee. Approval will only be given in extreme circumstances.

Measurement / Objective criterias testing	INFO EXAMPLE:
Tolerances: Mesurments: <500mm± 2 / ≥500mm ±4mm Level / plumbing: bubble into the lines (touch allowed)	Take 2 (sort) mesures by the examples in wall (correct =1 /no correct =0)
Judgement criterias testing (To do with the flash cards, at the same time, and the difference between the highest and lower can´t be more than 1 point. If difference >1, have to do new judgement)	INFO / EXAMPLE: Take 2 cut´s / angle directions of duct in exemples in the wall, to judge (ex. below:) 0 point: The opening between cut´s is >4 mm 1 point: The opening between cut´s is >2 mm <4 mm 2 point: The opening between cut´s is >1 mm <2 mm 3 point: The opening between cut´s is <1 mm

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the skills in each section of the Standards Specification.

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 2.1.

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 the EuroSkills Competition's 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 Standard Specification. Section 2.1 refers.

5.2 Format/ structure of the Test Project

[ ] Test Project assessed at end of Competition

[X] Test Project with separately assessed modules

[ ] Test Project assessed in stages

[ ] Series of standalone modules

[ ] Other

If other, please specify here:

5.3 Test Project design requirements

The application selected for the competition concerns for example the installation of a certain building.

Tasks to be carried out by the Electrician:

- Task 1: Installation and connecting of Distribution box, cables and wire ways, cabling and wiring, mounting and connecting electrical equipment; Commissioning and testing of the installation; Programming and commissioning Bus System KNX – 17 hours (full functionality provided prior to the last 4 hours)
- Task 2: Theoretical Test – 1 hour

Theoretical Knowledge

Theoretical knowledge is required and tested explicitly.

The theoretical part of the competition is limited to approximately 60 minutes. It will consider the following areas:

- Technology
- Circuit technology
- Operational analysis
- Technical calculation

Both written or multiple-choice tests are eligible. The theoretical part will consist of design, diagrams, drawings and symbols to ensure an easy understanding by the candidates. The theoretical part stands alone; the test needs to have a practical view but is not linked to the practical competition tasks.

Up to one hour before the theoretical test the content of the theoretical part of the competition will be known only by three people: the CE, DCE and nominated Expert.

The theoretical test will be distributed one hour before use to the national Expert who can translate the questions in handwriting to the Competitor. The questions will be open for clarification before the test starts.

Knowledge of Competition Rules and Regulations is not examined.

5.4 Test Project development

The Test Project MUST be submitted using the templates provided by WSE. Use the Word template for text documents and DWG template for drawings. Please contact jordy.degroot@worldskillseurope.org for guidance.

5.4.1 Who develops the Test Projects or modules

The Test Project / modules are developed under the supervision of the Jury President and Chief Expert by:

[ ] All Experts

[ ] Some Experts

[ ] Nominated Experts

[ ] Equipment supplier

[X] Chief Expert, Deputy Chef Expert under supervision of the Jury President

5.4.2 How and where is the Test Projects or modules developed

The Test Project or modules are developed:

[X] Jointly on the Discussion Forum

[ ] By an external enterprise

[ ] Independently

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
At the previous Competition	not applicable
6 months prior to the Competition	Until 6 months before the current Competition
At the competition	not applicable

5.5 Test Project validation

The test project will be validated by the experts and the Competition Manager.

5.6 Test Project selection

[ ] By vote of Experts at the previous Competition

[X] By vote of Experts on the Discussion Forum

[ ] By vote of Experts at the current Competition

[ ] By random draw by Technical Director 3 months before the current Competition

[ ] Other

If other, please specify here

5.7 Test Project circulation

The Test Project is circulated via the website as follows:

[ ] Submitted to the Secretariat for circulation 3 months before the current Competition

[ ] Not circulated

[X] Other

If other, please specify here

1 month before the current competition

5.8 Test Project coordination (preparation for competition)

Coordination of the Test Project will be undertaken by:

[ ] Skill Management Team

[ ] Chief Expert

[X] Chief Expert and Deputy Chief Expert

[X] Chief Expert and Workshop Manager

[ ] Chief Expert with selected Experts

[ ] Chief Expert with Competition Organizer

[ ] Experts

[ ] Other

If other, please specify here:

5.9 Test Project change at the competition

According to general rules (30% change)

For example:

- Theorethical test
- Automation Functions
- Scheme not published

5.10 Material or manufacturer specifications

Information will be given by the organizer at least 4 months before the current competition.

6 Skill management and communication

6.1 Discussion forum

Prior to the EuroSkills Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the skill specific Discussion Forum, which can be reached via www.worldskillseurope.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 WorldSkills Europe website www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The information includes:

- Competition Rules
- Technical Descriptions
- Marking Schemes
- Test Projects
- Infrastructure List
- Health and Safety documentation
- Other Competition-related information
- List of material that can be used to build templates and not been provided by the host

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

6.4 Day-To-Day management

The day-to-day management of the skill competition during the EuroSkills 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 at www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

7 Skill specific safety requirements

Refer to Host Country/Region Health and Safety documentation for Host Country/Region regulations.

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials and facilities provided by the Competition Organizer.

The Infrastructure Lists will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

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

Information about materials, equipment and tools supplied by Competitors will be distributed with the Test Project at least 3 months prior the current competition..

8.3 Materials, equipment and tools supplied by the organizing country

Not applicable

8.4 Materials and equipment prohibited in the Skill area

Only the electrical tools shown in the table below are permitted

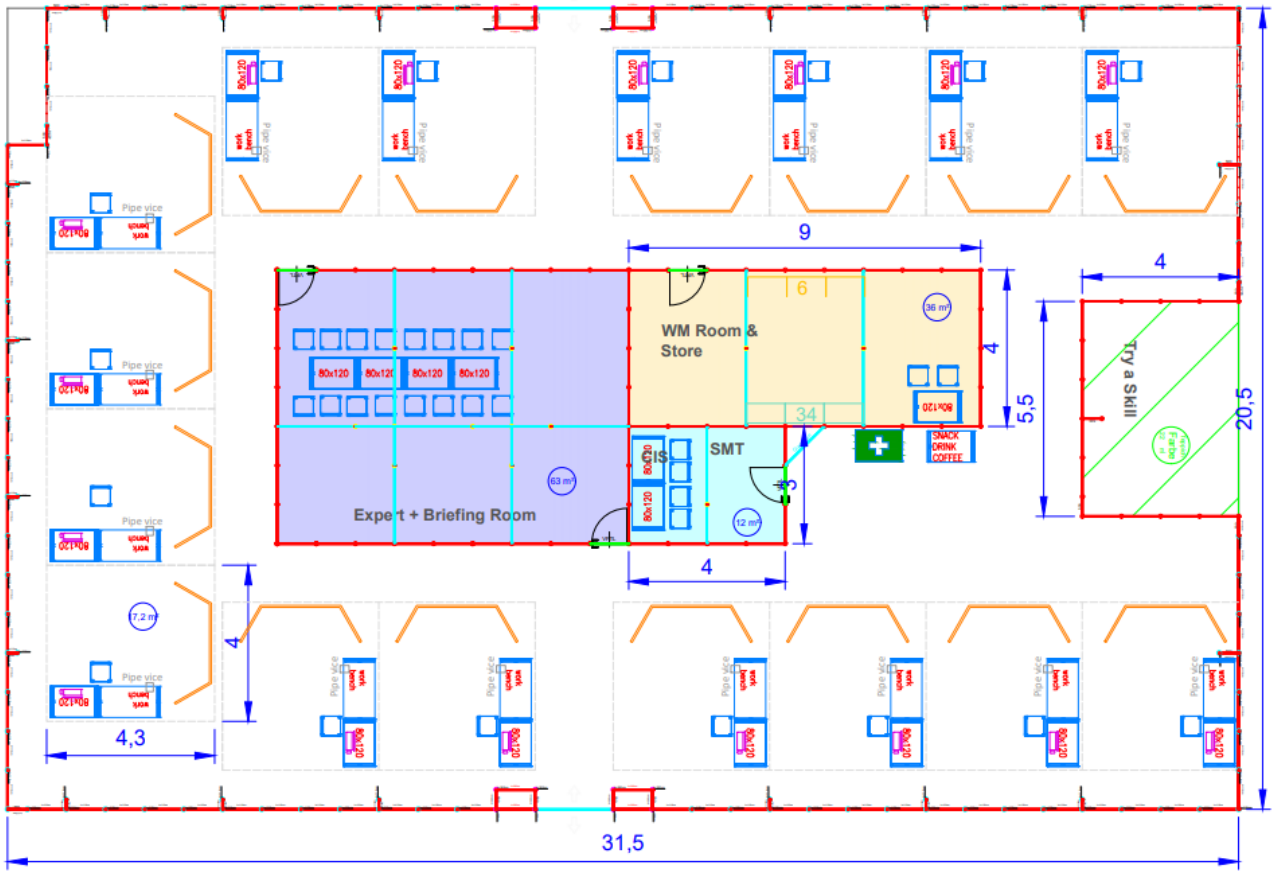
ITEM	DESCRIPTION	PICTURE
1	Hand held jig saw;	

ITEM	DESCRIPTION	PICTURE
2	Vibration (multifunctional) tool;	
3	Laser with two lines (one horizontal and one vertical);	
4	Two battery powered drills;	
5	Heat gun;	
6	Vacuum cleaner;	
7	Labeling device	

8.5 Proposed workshop and workstation

Workshop layouts from previous competitions are available by contacting the Competition Coordinator at: jordy.degroot@worldskillseurope.org

Workshop layout:



9 Visitor and media engagement

- Try a trade
- Display screens
- Test Project descriptions
- Enhanced understanding of Competitor activity
- Competitor profiles
- Career opportunities
- Daily reporting of competition status
- Time based parts of the Test Project

10 Sustainability

- Recycling
- Use of ‘green’ materials
- Use of completed Test Projects after Competition