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:

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

Industrial Mechanic Millwright

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

Industrial mechanic millwrights maintain and repair stationary industrial machinery, mechanical equipment, automated and robotic systems. There is a direct relationship between the nature and quality of the product required and the payment made by the customer/employer. Therefore the industrial mechanic millwright has a continuing responsibility to work professionally in order to meet the requirements of the customer/employer and thus maintain and grow the business. Industrial mechanic millwrights are most often involved with installing, maintaining, repairing and removing machinery and equipment in industrial plants and factories.

The industrial mechanic millwright works indoors and outdoors, and on small and large projects. He or she will plan and design, select and install, commission, test, report, maintain, fault find mechanical industrial systems to a high standard. Work organization and self-management, communication and interpersonal skills, problem solving, flexibility and a deep body of knowledge are the universal attributes of the outstanding industrial mechanic millwright.

Generally, the industrial mechanic millwright works in a team and occasionally alone. The individual takes on a high level of personal responsibility and autonomy. Every step in the process matters. This covers working to provide a safe mechanical installation and maintenance service, in accordance with relevant standards, through to diagnosing malfunctions, and commissioning stand-alone industrial mechanical and automated systems. Concentration, precision, accuracy and attention to detail are all essential because mistakes are largely irreversible, costly and potentially life threatening.

With the international mobility of people the industrial mechanic millwright faces rapidly expanding opportunities and challenges. For the talented industrial mechanic millwright 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 industrial installations is therefore likely to expand.

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**
	The individual needs to know and understand: • Health and safety legislation, obligations and documentation • The principles of working safely with all forms of industrial equipment and industrial settings • 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 and organized work area • Sustainability measures applying to the use of 'green' materials and recycling • The ways in which working practices can minimize 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 industrial 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 industrial equipment • Plan the work area to maximize efficiency and maintain the discipline of regular tidying • Measure accurately • Prioritize work and manage time effectively • Work efficiently and check progress and outcomes regularly • Establish and consistently maintain high quality standards and working processes. • Proactively engage in continuous professional development in order to effectively apply new technologies and working practices	
2	**Planning and Design**	**5**
	The individual needs to know and understand: • Different types of standards, blueprints, schematics, and installation descriptions • Procedures and manuals+ • Range of materials and installation techniques used in different environments	

	The individual shall be able to: • Read, interpret and revise drawings/blueprints and documentation including: • Layout and schematic drawings • Follow written instructions • Plan installation work using blueprints, schematics and protocol documentation provided	
3	**Communication and Interpersonal Skills**	**10**
	The individual needs to know and understand: • The significance of establishing and maintaining customer/employer 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 misunderstandings and conflicting demands	
	The individual shall be able to: • Interpret customer requirements and positively manage customer/employer expectations • Provide advice and guidance on products and or solutions e.g. new updated technologies • Visualize and translate customer/employer wishes making recommendations which meet/improve their design and budgetary requirements • Question customers/employers to fully understand requirements • Provide clear instructions • Introduce related trades to support customer/employer requirements • Produce written reports for customers/employers when required • Produce a cost and time estimate for customers/employers • Recognize and adapt to the changing needs of related trades • Work effectively individually and as a member of a team • Communicate effectively to avoid misunderstandings • Resolve conflicts in the workplace	
4	**Problem Solving, Innovation and Creativity**	**10**
	The individual needs to know and understand: • The common types of problem that 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. new and improved hydraulic fluid power components, the benefits of vibration analysis and thermography in industrial machinery.	

	The individual shall be able to: • Check work regularly to minimize problems at a later stage • Identify problems originating from the work of a related trade e.g. machine foundation for a conveyor system, a high vibration reading from a bearing • Challenge incorrect information to prevent problems • Recognize and understand problems swiftly and follow a self-managed logical process for resolving problems • Recognize opportunities to contribute ideas to improve the solution and overall level of customer/employer satisfaction • Demonstrate a willingness to try new methods and embrace change e.g. ready-made components and new types of monitoring equipment	

5	INSTALLATION	30
	The individual needs to know and understand: • Safety legislation, lock-out and isolation procedures, protective clothing and equipment and housekeeping rules • The selection, safe use and care of the cutting and non-cutting tools • Units of measurement used, and the skilled use of these measuring devices • Principles of metal cutting and in the relationship between speeds and feeds during the various machining operations with work holding devices, accessories and cutting tools • Machining operations of the milling machine and centre lathe to produce component parts to prescribed tolerances and standards • The applications of fasteners • Different types of lubricants their properties and applications. • Correct hand signals, lifting, rigging, hoisting procedures and SWL calculations for the removal and installation of mechanical industrial equipment • How to set-up and operate Oxy Fuel, SMAW, MIG and TIG welding equipment • How to read welding drawings/blueprints, layout, measure, tack, weld and assemble metal and other components to specifications. • Prepare and pour a cement or polymeric grout foundation for a machine base or sole plate • The basic underpinning knowledge of electrical and electronic theory. Electric and electronic terminology, schematics, applications and associated tools • How to read & interpret engineering drawings/blueprints and schematics and have the ability to effectively use manufacturer's manuals • How to select, remove, install, and maintain anti-friction bearings and be able to interpret ISO charts and bearing catalogues • The need to identify, remove, select and install the appropriate power transmission system (chain, belt, gear) and/or components for a specific application, e.g. reduction gearbox worm shaft and worm/bull gear • The use of precision measuring equipment as it pertains to part sizes, machine installation, set-up, alignment and preventative maintenance. • Types and principles of operation of various material handling systems, e.g. conveyors. • The principles and applications of hydraulics/pneumatics and safety as it relates to fluid power systems. The ability to identify, select, remove and install pipe systems, pumps and valves for specific applications and the ability to perform pertinent calculations, installations, maintenance and troubleshooting	
	The individual shall be able to: • Select and install equipment as per blueprints and documentation provided • Apply all machinery and equipment lock-out and de-energizing procedures (mechanical, electrical and hydraulic) before commencing work, maintenance or overhaul procedures • Correctly select and use hand cutting tools for shaping components to specifications, such as: files, drills, taps, reamers, countersinks and counterbores	

	• Demonstrate the use of and interpret readings from the following devices: scales, micrometers, vernier calipers, dial indicators, feeler gauges, combination sets, squares and laser measurement and alignment devices and vibration and themography measurement. • Set up and safely operate a vertical milling machine and centre lathe. Use High Speed Steel and/or Carbide cutting tools to perform the following machining operations machining within a unit of tolerance: drilling, tapping, and countersinking, counter boring facing, slotting and cutting keyways. • Identify and select bolts, nuts, dowels, snap rings, chemical fasteners, adhesives and fasteners for specific applications • Comply with all safety rules, manufacturers' specifications and proper usage protocols' and environmental legislation when handling and storing lubricants • Select, inspect and use the correct hoisting and rigging equipment and SWL calculations for specific applications, including: ropes, eye bolts and come-alongs • Apply metal inert gas (Oxy Fuel, SMAW,MIG and TIG) welding and fabrication techniques including: layout, joint preparation • tack, prevention and correction of distortion and fabricate materials to assemble components using drawings • Prepare a foundation, machine base or sole plate using the proper techniques for anchoring, shimming and leveling for a concrete or grouting pour • After correct lockout and tag-out, use a multi-meter to ensure electrical components are not "live" and to check current and voltage • Using electrical testing instruments safely trouble shooting, remove and reset electrical and electronic overload devices • Read and interpret 1st and 3rd orthographic projections, multi-view projections and auxiliary views of machine components, read and interpret assembly and detail drawings of machine components including bill of material, title block and change orders, read and interpret basic principles of geometric tolerance and symbols • Remove, inspect, repair/replace, install, set clearance, fit and align anti-friction bearings, using the bearing manufacturers' catalogue • Effect the removal, inspection, repair or replacement and the installation, alignment and tensioning/or setting of "backlash", tooth pattern or impeller setting of a centrifugal pump, a reduction gearbox, chain drive, belt drive, or gear drive system. • Perform a removal and install on a material handling system for example a belt splice and fasten conveyor belt for a specific application • Identify, select and use appropriate measuring/alignment devices/tools to: align equipment and track material handling systems drives and take appropriate readings/ measurements e.g. vibration and thermography reading on material handling systems drives. • Remove, repair and select/replace the correct flow control valves and circuit as per manufacturers' schematic drawing for a hydraulic/pneumatic system • Select the correct size and type of piping, tubes and hoses available for a hydraulic/pneumatic system	

6	**TESTING, REPORTING AND COMMISSIONING**	**20**
	The individual needs to know and understand: • Industrial regulations and standards applicable to different types of machines • Installations • Verification standards, methods and reports to be used to record verification results • Types of measuring instruments e.g. micrometres, vernier calipers, • Laser alignment/measuring tools/vibration analysis/thermography • Tools and software used for programming and commissioning • The correct operation of the machine installation in accordance with the planned specification and customer/employer requirements	
	The individual shall be able to: • Test installations before energizing to ensure personal, electrical and mechanical safety to include a complete visual inspection • Test installations when energized by checking complete function on all equipment installed to ensure correct operation of new/repaired or refurbished installation as per instructions • Set the installation to fully functioning and ensure operator can safely, effectively and efficiently perform required functions to meet customer/employer satisfaction.	
7	**Maintenance, Fault Finding and Repair**	**20**
	The individual needs to know and understand: • Different types of installations/equipment for specific environments • Different generations of installations/equipment • The purpose of a specific installation/equipment • The customers/employers needs for various functions of installation/equipment	
	The individual shall be able to: • Adapt to changing circumstances • Troubleshoot electrical, mechanical, power transmission and fluid power installations and identify faults and repair as required • Verify that existing installations/equipment still meet current standards • Use, test and calibrate measuring equipment as needed	
	Total	**100**

3 THE ASSESSMENT STRATEGY AND SPECIFICATION

3.1 GENERAL GUIDANCE

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment 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
		A	B	C	D	E	F	G	H	I	
STANDARD SPECIFICATION SECTIONS	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
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	Pour and level foundation for base			
B	Install and level conveyor unit on base			
C	Machine (centre lathe/vertical milling machine and hand finish required part/s			
D	Install Hydraulic power pack tray, assemble and install power pack parts			
E	Fabricate and weld required part/s			
F	Power Transmission parts preparation, installation and alignment			
G	Final function and commissioning of conveyor unit			
H	Rebuild a centrifugal pump or a reduction gearbox			
I	Check installation, alignment, vibration and thermography readings on a centrifugal pump or a reduction gearbox			
Total			100	100

4.8 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

As this skill competition is under development the Skill Assessment Specification and breakdown of Subjective and Objective marking will be defined during the preparation phase of the skill competition. Agreed procedures will be included for WSC2017.

4.9 SKILL ASSESSMENT PROCEDURES

- The Experts will split into working groups and assigned parts of the project to mark. These groups will mark all of the same criteria for all Competitors
- A timetable will be prepared by the Experts as to when parts must be handed in for marking
- These parts will be marked as and when they are completed and presented by the Competitor
- An Expert must not mark their compatriot Competitor's components
- Parts must be handed in for marking before assembly
- Expert teams will be selected by the CE and the DCE
- A mix of experience will be required in each Expert Team
- The manual measuring tools which are used will be the same ones that are used to set Competitors' standards.

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 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 5.3 refers.

5.2 FORMAT/STRUCTURE OF THE TEST PROJECT

Test Project assessed in stages.

5.3 TEST PROJECT DESIGN REQUIREMENTS

Test Project design requirements are as stated.

Materials to be included in the design are as follows:

- All work must be done using the materials and the infrastructure in normal use in the Host Country/Region. An exception is those parts which the project designer has brought with him or which are provided
- Competitors must be able to work with the materials specified below and must be able to comply with environmental requirements
- General-purpose structural steel angle iron and flat sheet-metal supplied.

Tolerance range specification

- Any tolerance used on the drawing must be ISO format or be supplied.
- Mechanical - all items produced by the Competitor will be utilized.
- The tolerances must be able to be inspected with the measuring tools that are listed on the IL.
- The choice of surface finish must reflect the desired results keeping in mind the material type.
- The drive components on the current IL may be changed for the Test Project.

The following are the guidelines for the percentage of work in hours and evaluation:

- Pour and level foundation for base (1 hr)
- Install and level Conveyor Unit on foundation Base (1 hr)
- Machine and hand finish required parts for conveyor stand (centre lathe/vert. milling machine) (3 hrs)
- Install hydraulic power pack tray, assemble and install hydraulic power pack parts (3 hrs)
- Fabricate, welding and hand finish required parts for conveyor stand (3 hrs)
- Power Transmission parts preparation and installation (4 hrs)
- Final function and commissioning of conveyor unit (1 hr)
- Rebuild, install and align a Centrifugal Pump or Reduction Gearbox (4 hrs)

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 nominated Experts.

5.4.2 How and where is the Test Project or modules developed

The Test Project or modules are developed jointly on the Discussion Forum.

5.4.3 When is the Test Project developed

The Test Project is developed by three months before the current Competition.

5.5 TEST PROJECT VALIDATION

Test Project validation will occur when it is presented to the Expert group attending the Competition. The presentation is to include a practical demonstration of the completed Test Project's function. The presentation of the unit is optional based on an agreement of the Experts.

There is to be a majority agreement (minimum = 50% +1) from Experts on the Test Project presented.

5.6 TEST PROJECT SELECTION

The Test Project is selected by vote of Experts on the Discussion Forum.

5.7 TEST PROJECT CIRCULATION

The Test Project is circulated via the website as follows:

Three (3) months before the current Competition.

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

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

5.9 TEST PROJECT CHANGE AT THE COMPETITION

As this skill competition is under development the Test Project change required will be defined during the preparation phase of the skill competition. Agreed procedures will be included for WSC2017.

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 Competition Organizer undertakes to provide information on the following equipment, six months before the Competition as per the Competition Rules:

- Machine tools and accessories;
- Welding equipment and tools;
- Fabrication equipment and tools;
- Power transmission parts and equipment;
- Fluid Power parts and equipment;
- Required hand, power, precision measurement and preventative maintenance tools.

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.

- All Experts and Competitors must use/wear proper PPE at all times while on the competition site;
- Experts will use the appropriate personal safety equipment when inspecting, checking or working with a Competitor's project;
- The documentation 'Safety and Fairness' will be prepared by the Experts;
- The Competitor must comply with the machine manufacturer's safety instructions.

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

Not applicable.

8.3 MATERIALS, EQUIPMENT AND TOOLS SUPPLIED BY EXPERTS

Not applicable.

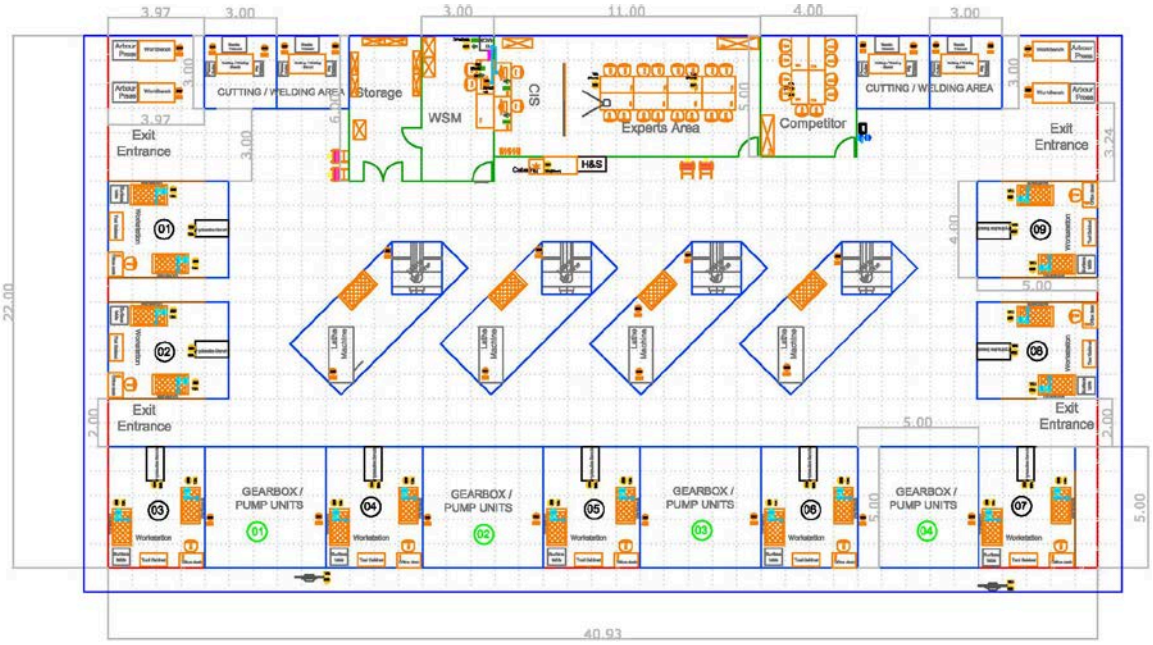
8.4 MATERIALS & EQUIPMENT PROHIBITED IN THE SKILL AREA

No outside materials or equipment is allowed on the competition site, all required materials and equipment is supplied by the Competition Organizers and competition sponsors.

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

- Try a trade;
- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status.

10 SUSTAINABILITY

- Recycling - All waste generated by the competitors on the competition site will be recycled;
- Use of 'green' materials - where possible the use of "green" materials will be maximized;
- Use of completed Test Projects after Competition - all the completed Test Projects will be donated to local technical institutions, colleges, universities and high schools.