CONSTRUCTION AND BUILDING TECHNOLOGY

Carpentry

WorldSkills Occupational Standards

 WSC2022_WSOS26_Carpentry

WorldSkills Occupational Standards (WSOS)

The name of the occupation is

Carpentry

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

A carpenter generally works on commercial and residential projects predominantly undertaking tasks using timber and timber related products. Carpentry is closely associated with other trades that make up the construction industry, working both individually and as part of a team to complete projects. A carpenter undertakes work both internally and externally within homes of customers and on construction sites in all weather conditions.

They are expected to interpret drawings, set out and measure, cut, form joints using both hand and power tools, assemble, and install finishes to a high standard. Carpenters also construct and install components that are seen on the inside and outside of residential or commercial buildings such as sidings, shutter, and roofing materials. They also make moulds for concrete formwork (called shuttering in some countries). Carpenters may also be involved in the design and construction of timber-framed buildings such as commercial buildings, dwellings, garages, sheds, gazebos, pergolas, and playhouses.

Work organization, self-management, communication, and interpersonal skills are integral parts of a carpenter's skill set along with problem solving, innovation and creativity. The ability to work precisely and accurately are fundamental attributes of an outstanding carpenter. Whether the carpenter is working alone or in a team, the individual takes on a high level of personal responsibility and autonomy.

Every step in the carpentry process matters; mistakes may be largely irreversible and could carry a very high cost. A Carpenter must work safely; demonstrate exceptional planning and organization skills, along with concentration and stamina paying attention to detail in order to achieve an excellent finish.

Carpenters must have technology skills to be able to use digital instruments such as GPS location devices, laser levels, electronic distance measurement devices and digital callipers. They must also be able to use specialist construction CAD software and project management (BIM) software.

With the international mobility of people, the carpenter faces rapidly expanding opportunities and challenges. For a talented carpenter there are many commercial and international opportunities. However, these also carry with them the need to understand and work with diverse cultures and trends.

A Carpenter usually receives his or her training by working as an apprentice with a more experienced professional. With this training, a carpenter has the ability to complete tasks that are more intricate and achieve a higher degree of accuracy and finish.

General notes on the WSOS

The WSOS 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/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. The Standard 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 only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard 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. This is often referred to as the "weighting". The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills that are set out in the Standards Specification. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, provided that this does not distort the weightings assigned by the Standards.

WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Safe work, organization and management**	5

The individual needs to know and understand:

- Task analysis and hazard identification and controls
- The appropriate selection and use of personal protective equipment (PPE)
- Safe use, care, handling, and storage of tools, equipment, and materials
- The importance of interpreting drawings, instructions, and specifications
- The importance of time activity planning and attention to detail, in all work practice
- The potential environmental impact and sustainability issues associated with a construction project

The individual shall be able to:

- Comply with relevant health and safety legislation, regulations, and obligations
- Identify and control (eliminate, isolate and/or minimize) hazards
- Select and use appropriate Personal Protective Equipment when necessary
- Safely use, maintain, handle, and store tools, equipment, and materials on site
- Complete projects safely, accurately and efficiently, as specified and within projected timelines
- Minimize the environmental impact of projects by efficient work practice, minimizing waste, and using appropriate equipment

2	**Business, communication, and interpersonal skills**	3

The individual needs to know and understand:

- The roles and responsibilities of parties involved in construction projects including, but not limited to, clients, architects, engineers, and sub trades
- Relevant methods of communications between the above people

The individual shall be able to:

- Interact with the relevant parties in construction projects
- Communicate clearly and comprehensively with parties involved in construction projects.

Section		Relative importance (%)
3	**Problem solving, innovation, and creativity**	7

The individual needs to know and understand:

- Common variables which may affect a construction project such as material availability or material defects
- Diagnostic approaches to problem solving
- The importance of currency of industry knowledge and likely future developments

The individual shall be able to:

- Anticipate and pre-empt common variables, for example through material selection.
- Solve problems at their root cause, rather than their symptoms
- Maintain currency of industry knowledge and trends through research, up-skilling, life-long training, and/or education
- Supervise their own work

4	**Reading and interpreting drawings and written instructions**	10

The individual needs to know and understand:

- Relevant conventions used in preparing drawings and written specifications, on paper or through computer assisted drafting (CAD) software and project management software (such as BIM)
- How to interpret drawings, written instructions, and specifications
- Relevant tolerances for accuracy

The individual shall be able to:

- Accurately interpret conventionally prepared or Computer Assisted Drafting (CAD) prepared drawings and specifications
- Select the correct materials to comply with drawings and specifications
- Where required, extrapolate information, using appropriate means or techniques
- Produce work within specified tolerances, or where none are given, to a suitable standard

5	**Setting out and measuring**	17

The individual needs to know and understand:

- The importance of accuracy in all setting out.
- The risks and potential consequences of cumulative and compounded errors
- Calculations and formulae used both in setting out and confirming accuracy

Section		Relative importance (%)
	The individual shall be able to: • Set out relevant aspects of construction projects accurately and clearly using conventional measuring tools and digital instruments such as GPS location devices, laser levels, electronic distance measurement devices and digital callipers. • Avoid cumulative and compounded errors • Use appropriate calculations and formulae to confirm accuracy	
6	**Forming joints and preparing members for assembly**	**20**
	The individual needs to know and understand: • The properties of timbers, timber-based construction materials and finished wood materials • Conventional methods of forming joints in timber (called lumber in some countries) • How to select appropriate hand and power tools to cut materials safely and accurately	
	The individual shall be able to: • Confidently work with timber and timber-based materials • Select and safely use hand and power tools to cut joints safely and accurately • Identify and cut joints as specified, or where required select and cut task appropriate joints	
7	**Assembly**	**20**
	The individual needs to know and understand: • How to assemble and erect structures, without damage to components, personal risk, or risk to others or property • The appropriate use of fasteners and hardware	
	The individual shall be able to: • Accurately assemble and erect structures without damage to components, personal risk, risk to others, or to property • Select and use specified fasteners, or where required, can select and use appropriate fasteners and hardware	
8	**Finishing**	**18**
	The individual needs to know and understand: • The importance of finishing as specified, or, where required, finish to an appropriate standard	

Section	Relative importance (%)
The individual shall be able to: • Finish to a specification, with attention to surface finishes and avoidance of damage or unsightly marking of components • Produce accurate joints and intersections with no gaps • Attach members neatly using appropriate fasteners • Where no specification is supplied, finishes to appropriate standards, with attention to the areas above	
Total	**100**

References for industry consultation

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/) ILO 7115
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.**onet**online.org/)

This WSOS appears most closely to relate to Carpenter:
http://data.europa.eu/esco/occupation/2a22ff9e-de3b-408d-b312-5034896cc4f4

or Construction Carpenters:
https://www.onetonline.org/link/summary/47-2031.01

Adjacent occupations can also be explored through these links.

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Shanghai 2022.

Organization	Contact name
Aannemersbedrijt Koningstijl (Netherlands)	Bouke Koopman, Director
Berufsschule Lenzburg (Switzerland)	Michael Huerbin, Teacher
Holzbau Schweiz (Switzerland)	Peter Elsasser, Business Unit Manager Education
PCL Constructors (North America)	Randy Callaghan, Workforce Supervisor