

# **English for Civil Engineering**

## **Part II**

### **STUDENT'S BOOK**



**Lect. univ. dr. Ionela IONIȚIU**

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## **Introduction**

So far, I have learnt that an interactive teaching/ learning activity that will value my students' interventions should focus on creating a scientific context that would stimulate the debates within my ESP seminars and lectures.

The textbook is a compilation based on the authentic texts adapted from websites and magazines (USA, UK, Canada) and is intended for civil engineering students. One of the aims of this project has been to develop materials both for testing the foreign language competence of civil engineers and for teaching them the language that they need to require for their professional certification.

I do not assume that my users will have an in-depth knowledge of civil engineering works. Therefore, the units have been devised to help students improve their knowledge and use of English in an engineering environment. Each unit covers vocabulary related to a certain topic area- ranging from basic civil engineering vocabulary to roads, architecture, bridges, types of foundations and so on- and is designed to reinforce and improve their communicative skills.

I have come to realize that the more realistic situations and contexts I will focus on, the more realistic my teaching materials and methods will become. My

lectures are addressed to intermediate and upper-intermediate students that already have basic knowledge of English grammar and, therefore, they are thematically-centered on developing the reading, writing, speaking and listening/viewing abilities that they need in order to communicate in their studying field. In other words, the lectures aim to help them:

- Increase their knowledge of technical English.
- Discuss familiar things, key engineering concepts and principles.
- Communicate with fellow students and engineers in other countries.
- And, nevertheless, become more fluent and accurate in a wide range of technical fields.

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**Task 2. Before reading the passage, discuss these questions:**

- a. What common hand tools do you know?
- b. Which hand tools would construction workers use to build a house?
- c. What tools could be used for cutting metal and sawing wood?

**Task 3. Reading (10 minutes)**

**3.1. Read the article below and complete the following tasks:**

The goal of this lecture is to familiarize students with the hand tools used in civil engineering and the construction trade, such as hammers, saws, levels, pullers, and clamps. The lecture will explain the specific role of each tool, how to properly use it, and the important safety and maintenance issues related to each tool.

To safely use each tool follow the standard operating procedures below. Every hand tool is listed and described in this document. If you are unsure how to use any of the hand tools, please carefully read this document or ask a lab technician for assistance.

(Adapted from:<https://www.tri-c.edu/programs/engineering-technology/manufacturing-engineering/documents/cuyahoga-community-college-ideation-station-hand-tools-standard-operating-procedures.pdf>;  
<https://www.tangischools.org/cms/lib/LA01001731/Centricity/Domain/5179/Mod3HandTools.pdf>)

**3.1.1. Mark the following statements as True (T) or False (F):**

- a. The article deals with the importance of using hand tools safely.
- b. The goal of the article is to list various useful hand tools.
- c. The article is a manufacturer's brochure to advertise a construction company.

**3.1.2. Choose the correct answer:**

- 1. What is the purpose of the article above?
  - a. to instruct how to use various hand tools
  - b. to give a narrow description of each hand tool
  - c. to suggest which hand tool to use adequately
  - d. to explain the specific role of each hand tool
- 2. Which of the following is NOT a hand tool?
  - a. Philips screwdriver
  - b. Sand paper
  - c. Adjustable wrench
  - d. Rubber gasket

**3.2. Read the texts below and perform the following tasks:**

A (*I.....*) is a heavy paper with abrasive material attached to its surface. (*I.....*) is part of the "coated abrasives" family of abrasive products. It is used to remove small amounts of material from surfaces, either to make them smoother (for example, in painting and wood finishing), to remove a layer of material (such as old paint), or sometimes to make the surface rougher (for example, as a preparation to gluing).

A traditional (2.....) looks like a short plank of wood and often has a wide body to ensure stability, and that the surface is measured correctly. In the middle of the spirit level is a small window where the bubble and the tube is mounted. Two notches (or rings) designate where the bubble should be if the surface is level. Often an indicator for a 45° inclination is included.

A (3.....) is a hand-tool for turning (driving) screws (and sometimes bolts or other machine elements with a mating drive system). A (3.....) will be easy to identify by its tip, which is shaped to fit, or mate with, a screw the head of which has a particular contour, or surface shape. A (3.....) is, thus, a mechanism to apply torque to a screw.

(4.....) are both cutting and holding pliers. They are often used by electricians and other tradespersons to bend, reposition and cut wire. Their namesake long gripping nose provides excellent control and reach for fine work in small or crowded electrical, while cutting edges nearer the pliers' joint provide "one-tool" convenience. Given their long shape, they are useful for reaching into cavities where cables (or other materials) have become stuck or unreachable to fingers or other means.

(Adapted from: <https://www.tangischools.org/cms/lib/LA01001731/Centricity/Domain/5179/Mod3HandTools.pdf>)

**3.2.1. Recognize and identify some of the basic hand tools and their proper uses in the construction trade. Fill in the blanks with the missing words.**

**3.2.2. Give the antonyms of the underlined words.**

## 4. Vocabulary

### 4.1. Match the words in column A with their definitions in column B:

1. Chisels	a. the part of a piece of equipment, especially electrical equipment, into which another part fits
2. punches	b. a tool consisting of a metal handle and a socket, used for turning objects in one direction only
3. pliers	c. a tool for breaking hard surfaces, with a long wooden handle and curved metal bar with a sharp point
4. ratchets	d. a thin, flat or rounded metal tool with rough surfaces for rubbing wooden or metal objects to make them smooth or to change their shape
5. wrenches	e. a tool with a rough blade, used for shaping wood or metal
6. sockets	f. a tool with a long metal blade that has a sharp edge for cutting wood, stone, etc.
7. Saws	g. a tool with a long or round blade and a row of sharp points along one edge, used for cutting hard materials such as wood or metal
8. files	h. a tool for holding and turning objects, especially one that can be made larger and smaller to hold different sized objects
9. rasps	i. a piece of equipment that cuts holes in a material by pushing a piece of metal through it

10. pickaxes	j. a small tool with two handles for holding or pulling small things like nails, or for cutting wire
--------------	--

**4.2. Write a word that has a similar meaning to the underlined part:**

a. This tool combination allows you to turn a nut or a bolt without repositioning the tool on the fastener — as it happens with a wrench when there isn't enough room to turn it in a full circle. = s \_ \_ \_ \_ t w \_ \_ \_ \_ h

b. A tool used to tighten or loosen screws that have a straight, linear notch in their heads. = f \_ \_ \_ \_ e \_ d s \_ \_ e \_ \_ \_ \_ e r.

c. A tool with a fine-toothed saw, originally and mainly made for cutting metal. = ha \_ \_ \_ \_ a w

d. A tool used to drive nails into a wooden surface, to shape metal or to crush/ smash something. = h \_ \_ \_ \_ r

e. This tool is used whenever you need to cut tape, cord, cardboard, or other packaging material. = u \_ \_ \_ \_ \_ y k \_ \_ \_ e

**4.3. Pair work activity – role play. Imagine you are a tool supervisor. Talk to your partner about what tools are needed to mend a cabinet. (10 lines)**

**5. Group work activity – brainstorming. Translate into English:**

Unelte necesare:

- veți avea nevoie de un creion de tâmplărie pentru a face marcaje pe lemn și piatră. În caz de urgență, este bun și un creion normal;
- ferăstraie (electrice sau clasice) pentru a tăia lemnele;
- cu ajutorul târnăcopului spargeți pământul pentru a facilita săparea fundației;
- cu o daltă plată, mai mult sau mai puțin largă, puteți îndepărta din locurile nepotrivite mortarul sau betonul întărit;

(Adapted from Manfred Braun, 2013, *Construcții de cărămidă*, editura M.A.S.T.)

**6. Listening/ viewing. Watch the video and try to perform the tasks:**

<https://www.youtube.com/watch?v=4o0tqF0jDdo>

**6.1. After viewing the material, mark the following statements as true (T) or false (F):**

- a. You can use a hammer and a punch to strike with and make a dimple.
- b. A ratchet is a driver.
- c. A Philips screwdriver has a flat tip.
- d. A ball-pin hammer is used for sawing wood.
- e. There are three different standard drills.

## **6.2. Answer the following questions:**

- a. How many tool families are mentioned in the video?
- b. What is a double-opening wrench?
- c. What is the difference between a socket wrench and a ratchet?
- d. What is the difference between a ball-pin hammer and a carpenter's hammer?

## **7. Writing**

***7.1. Write a short paragraph (no more than 70 words) describing a hand tool you frequently use.***

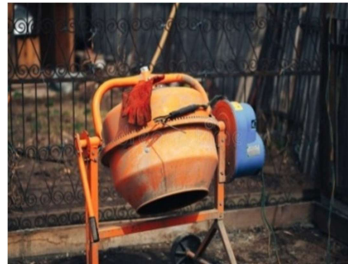
***7.2. Comment on the following statement: There are some basic tools that every homeowner should own, whatever their skill level. (200 words)***



## Chapter 2

### Tools and equipment used in civil engineering

**Task 1. Group work activity. Conversation (5 minutes).  
Look at the pictures below and try to identify/list as many construction tools as possible.**



(Source:  
<https://www.google.com/search?source=univ&tbm=isch&q=tools+and+equipment+used+in+civil+engineering+pictures&sa=X&ved=2ahUK-EwiqysTj-u3qAhVosYsKHTduD54Q7Al6BAGHECw&biw=1366&bih=657#imgrc=tCZeGm4TkeAUzM>)

**Task 2. Before reading the passage, discuss these questions:**

1. What machine makes cement?

2. Name some tools used to collect/ spread building materials.

3. What tools will you use to break up a concrete slab?

### **Task 3. Reading**

#### **3.1. Read the text below and complete the following tasks:**

*Masonry* work is one of those home improvement skills that few homeowners attempt to master. Drywall, electrical, plumbing, and painting get most of the do-it-yourself attention, while masonry is often hired out to skilled masons. Yet do-it-yourself masonry work can be highly satisfying and creative. And aside from the pleasure of seeing a job well done, one of the great things about doing masonry work is that its tools and materials are basic, inexpensive, and easy to comprehend. Once wet concrete starts to pour, you need to be prepared to move quickly. No one wants to get to the job site and realize they left a tool behind. In case you are for pouring cement or concrete here's an exhaustive list of construction tools you might need on a concrete construction site from start to finish:

#### **Mixers**

Whether you're mixing in a truck, a portable mixer or a wheelbarrow, you want to be sure your concrete is thoroughly mixed for maximum strength and durability.

#### **Compactors**

If the site of the concrete slab is to be prepped with a sub-base of any type, a compactor helps settle the stone or aggregate into position.

## **Levels**

Both the sub-base and slab surface must be leveled. A standard long-line level, or a laser level, will let you verify that the slab is completely according to spec before pouring and after.

## **Moisture Retarders**

Moisture or vapor retarders are used to prevent water vapor from intruding on a finished concrete slab. They are generally placed directly under on grade or below grade slabs.

## **Saws**

Reciprocating saws, circular saws or grinders can be necessary to cut rebar or forms on the job site. They can also be necessary if a problem develops under the slab and a portion of the concrete has to be removed after it has set and dried.

## **Screeds**

Screeds come in a variety of sizes and can be a specific tool (also called straight edges or bump cutters), or can be simple flat pieces of dimensional lumber. The purpose of a screed is to smooth concrete after it has been moved into place by scraping away any excess from the slab surface.

## **Bull Floats**

Bull floats are wide-bladed tools on a long (possibly telescoping handle) that provide the first pass for leveling

ridges and filling voids in the concrete after the screed work has been done.

(Adapted from: <https://www.thespruce.com/overview-of-materials-for-masonry-work-1821974>;

<https://www.wagnermeters.com/concrete-moisture-test/concrete-info/30-top-tools-concrete-construction-site/>)

**3.1.1. Mark the following statements as True (T) or False (F):**

1. In case the concrete slab is provided with a sub-base the screeds are used to verify if the slab is leveled.
2. Moisture retarders are mainly used to trap water inside the concrete slab.
3. In case a problem occurs beneath the hardened concrete slab you can use a saw to cut and remove that portion.

**3.1.2. Choose the correct answer:**

1. What is the purpose of the excerpt?
  - a) to prevent tool damage
  - b) to assess tool purpose
  - c) to describe tool quality
2. Which tool was NOT mentioned in the text:
  - a) bull float
  - b) grinder
  - c) screed
  - d) compactor