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PROFESSIONAL ENGLISH: CIVIL ENGINEERING

2nd Edition: Revised and Expanded

Editura Universității Transilvania din Brașov

2025

EDITURA UNIVERSITĂȚII TRANSILVANIA DIN BRAȘOV

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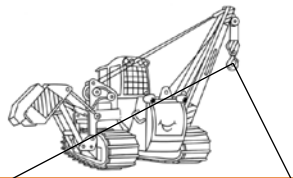
Editură acreditată de CNCS, categoria B
pentru domeniul Filologie (2020)

ISBN 978-606-19-1830-0 (ebook)

Lucrarea a fost avizată de Departamentului
de Lingvistică teoretică și aplicată,
Facultatea de Litere a Universității Transilvania din Brașov.



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INTRODUCERE

Volumul se adresează studenților de la Facultatea de Construcții care doresc să își perfecționeze cunoștințele de limbaj tehnic în domeniul ingineriei civile. Volumul este destinat cursanților cu un nivel pre-intermediar și intermediar de cunoaștere a limbii engleze.

Prima ediție, publicată în 2022, la Editura Universității Transilvania din Brașov, este organizată în 14 unități care acoperă două semestre de studiu al limbii engleze, din cadrul Facultății de Construcții. Capitolele abordează teme variate din ingineria civilă cum ar fi specializări, meserii, unelte, utilaje, procese, aplicații și tehnologii. Suportul de curs se adresează specializărilor *Construcții Civile, Industriale și Agricole*, *Căi ferate, Drumuri și Poduri* și *Instalații pentru Construcții.*

Această ediție revizuită și adăugită include **șase capitole noi** al căror scop este de a completa conținutul existent din ediția precedentă. Trei unități (U15-U17) sunt dedicate programului *Instalații pentru Construcții*, fiind adaptate nevoilor studenților din acest domeniu. Unitatea 18 introduce elemente arhitecturale, reprezentând o extensie interdisciplinară relevantă pentru ingineria civilă. Două unități de recapitulare (U19-20), care revizuiesc și consolidează elementele tehnice esențiale din volum, completează cea de-a doua ediție.

Prin utilizarea unor surse variate (materiale online, cărți și cursuri de specialitate, videoclipuri, dicționare tehnice) lecțiile respectă următoarea structură:

- Introducerea elementelor de vocabular prin diferite tipuri de exerciții;
- Întrebări referitoare la conținutul tehnic al unităților propuse;
- Listă de cuvinte noi;

Organizarea materialului didactic urmărește însușirea unui limbaj profesional de bază, familiarizarea cititorilor cu pronunția cuvintelor, exerciții interactive axate pe comunicare și munca în echipă și obținerea unor deprinderi elementare de comunicare în mediul profesional.

INTRODUCTION

This volume is addressed to students of the Faculty of Civil Engineering who wish to improve their knowledge of technical language in the field of civil engineering. It is intended for learners at pre-intermediate and intermediate levels of English proficiency.

The first edition, published in 2022 by the Transilvania University Press of Brașov, is organized into 14 units covering two semesters of English language study within the Faculty of Civil Engineering. The chapters explore a wide range of topics in civil engineering such as specializations, professions, tools, equipment, processes, applications, and technologies. The course material is designed for the specializations Civil, Industrial and Agricultural Constructions; Railways, Roads and Bridges; and Building Services.

This revised and expanded edition includes six new chapters aimed at supplementing and complementing the content of the previous edition. Three units (U15–U17) are dedicated to the Building Services program, tailored to the needs of students in this field. Unit 18 introduces architectural elements, representing an interdisciplinary extension relevant to civil engineering. Two review units (U19–U20), which revisit and consolidate essential technical elements from the volume, complete the second edition.

By using a variety of sources (online materials, specialized books and courses, videos, technical dictionaries), the lessons follow the structure below:

- Introduction of vocabulary elements through different types of exercises
- Questions related to the technical content of the proposed units
- A list of new words

The organization of the teaching material primarily aims at acquiring a basic professional language, familiarizing readers with word pronunciation, interactive exercises focused on communication and teamwork, and developing elementary communication skills in a professional environment.

List of Figures

UNIT 1: AN INTRODUCTION INTO CIVIL ENGINEERING

1. **Classroom Discussion.** What do you know about Civil Engineering? What does a civil engineer do? Can you mention some branches of Civil Engineering? Write down your answers.

_____
_____
_____
_____
_____

2. 🎧 **Pronunciation.** There are different specialties in the field of Civil Engineering. Look at the table below. Listen to the words twice and pronounce them. **Note:** You can use your camera phone to access the QR code or you can copy the link in a web browser.

URL: https://tinyurl.com/2jyr72zd

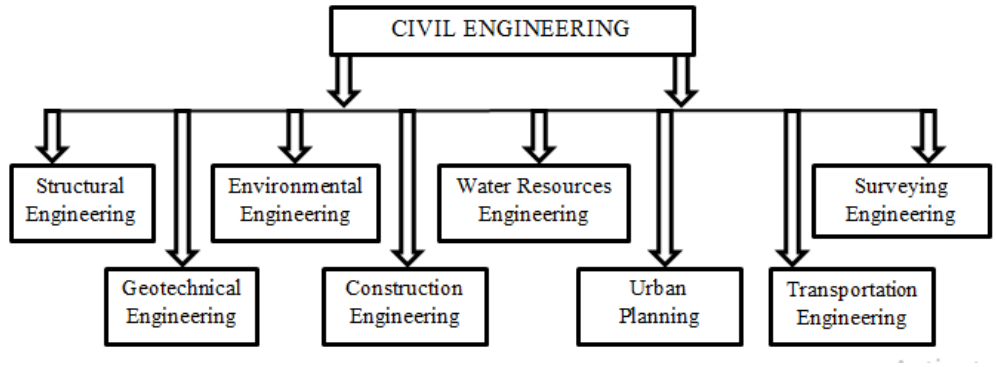

Figure 1. Civil Engineering Branches

3. Vocabulary - Specialties in Civil Engineering. Match the words with the definition:

A. *Integrates land use planning, infrastructure planning, and public policy for new developments or renewal of urbanized communities. Successful urban planning requires the application of the knowledge developed in social, economic, architectural, and engineering studies.*	**1.** Environmental Engineering
B. *The application of engineering means to protect human health and to preserve the natural environment by managing and developing water, air, and land resources. It relies on the fundamental sciences of chemistry, biology, ecology, and health sciences.*	**2.** Transportation Engineering
C. *A specialty dealing with the use of water in support of modern living, including the agricultural, industrial, domestic, recreational, and environmental needs.*	**3.** Urban Planning
D. *The technical specialty that deals with soil and rock as supporting materials for structures. It deals with the various foundation types that work between the structure and the ground.*	**4.** Geotechnical Engineering
E. *Deals with the efficient transport of people and goods.*	**5.** Structural Engineering

F. *Transforming design details on paper or a computer file into physical reality.*	**6.** Surveying Enginnering
G. *The technical specialty that deals with the analysis and design of constructed structures.*	**7.** Water Resources Engineering
H. *The technical specialty that applies the science of measurement to the assembling of spatial data on land and sea and any natural or constructed objects.*	**8.** Construction Engineering

(Definitions taken and adapted from Mau, S.T., and Sami Maalouf. 2015. *Introduction to Civil Engineering. A student's guide to academic and professional success*. San Diego: Cognella Academic Publishing, pp. 1-12)

4. Vocabulary - Civil Engineering constructions. Write down the types of constructions in Civil Engineering shown in the pictures below.

A._____; **B.**_____;

C._____; **D.**_____;

E._____; **F.**_____;

G._____; **H.**_____;

I._____; **J.**_____;

5. Translations - Defining Civil Engineering. Translate the sentences from English to Romanian.

A. *The term 'civil engineering' describes engineering work performed by civilians. In general, it describes the profession of designing and executing* ***structural works*** *for the general public*.

_____
_____
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B. *Civil engineering covers different areas of engineering, including the design and construction of large buildings,* ***roads***, ***bridges***, ***railway lines***, ***canals,*** ***airports***, ***water-supply systems***, ***dams***, ***irrigation***, ***harbours***, ***docks***, ***aqueducts***, *and* ***tunnels***.

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C. *The civil engineer needs a thorough knowledge of* ***surveying***, *of the properties and mechanics of construction materials, of the* ***mechanics*** *of* ***structures*** *and* ***soils***, *and of* ***hydraulics*** *and* ***fluid mechanics***. *Today civil engineering includes the production and distribution of* ***energy***, *the development of* ***aircraft*** *and airports, the construction of* ***chemical process plants*** *and* ***nuclear power stations***, *and* ***water desalination***.

_____
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_____

(Taken and adapted from: Brieger, Nick, and Alison Pohl. 2002. *Technical English Vocabulary and Grammar*. Oxford: Summertown, p. 44.)

Unit of measurement		Definition
Length	Lungime	The size or measurement of something from one end to another.
Width	Lățime	The measurement or extent of something from side to side.
Height	Înălțime	The measurement of someone or something from head to foot or from base to top.
Depth	Adâncime	The distance from the top or surface to the bottom of something.
Weight	Greutate	A body's relative mass or the quantity of matter contained by it.
Circumference	Circumferință	The enclosing boundary of a curved geometric figure, especially a circle; the distance around something.

(Definitions taken from https://tinyurl.com/mtv5sy4j)

6A. Reading. Based on the information presented above, read the text and write down (in the table), the correct units of measurement.

Located in the western part of the United States, in the state of California, the Golden Gate Bridge was inaugurated on May 27, 1937. The bridge connects the city of San Francisco with the city of Sausalito, crossing the strait that connects the Pacific Ocean (to the west) with the Gulf of San Francisco (to the east).

With a total lenght of 2734 m, this bridge became famous for being the first huge construction suspended over 150 m above sea level. The Golden Gate Bridge is 27.4 meters wide and 227.4 meters high. The bridge is made of steel and is transited by about 118, 000 cars every day and has a total weight of 887, 000 tons.

Total length of the bridge	
Width of the bridge	
Height of the bridge	
The main material used for manufacturing the bridge	
Number of vehicles crossing the bridge (on a daily basis)	
Total weight of the bridge	

7. Translation. Translate the sentences from English to Romanian.

A. Cea mai mare tomată din lume a fost crescută în Statele Unite ale Americii. Aceasta avea o **circumferință de 83,8 cm** și **o greutate de 4,896 kg.**

_____

_____

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_____

B. Localizată în partea de vest a Oceanului Pacific, Goapa Marianelor are o **adâncime** de **10984 de metri.**

_____

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C. Cel mai înalt munte din sistemul nostru solar se află pe planeta Marte. Olympus Mons are o **înălțime** totală de **24 de km** fiind de aproximativ **3 ori mai înalt** ca Muntele Everest.

D. Cea mai mare pizza calzone **cântărea 31,4 kg** și a fost realizată în orașul West Lafayette din Statele Unite ale Americii. Aceasta avea o **lungime de 2,84 m** si o **lățime de 55,88 cm.**

Unit 1: Additional exercises

8. Speaking. Read the questions. You will have 2 minutes to think about them. You can write down key words. During a classroom discussion, provide an answer for each of them.

A. Why have you decided to study Civil Engineering?

B. Is there a particular branch of Civil Engineering that you would like to specialize in?

C. What job would you like to do after finishing your studies?

You can write some notes here:

_____
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9. Writing. Exercises 3 and 5 bring into question some structures and constructions made by civil engineers. Can you think of any others? Write your answer in 50-100 words.

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Key words: Glossary of Terms (UNIT 1)

At the end of each lesson, you can find a list of English terms and key words, used throughout the exercises.

English	Romanian
road	drum
bridge	pod
railway lines	căi/linii ferate
airport	aeroport
aircrafts	aeronave
water-supply systems	sisteme de alimentare cu apă
dam	baraj
irrigation	irigații
harbour	port
dock	doc
aqueduct	apeduct
tunnel	tunel
surveying	topografie
soils	soluri
fluid mechanics	mecanica fluidelor
nuclear power station	centrală nucleară
environmental engineering	ingineria mediului
transportation engineering	ingineria transporturilor și a traficului
urban planning	planificare urbană
geotechnical engineering	inginerie geotehnică
structural engineering	inginerie structurală
surveying engineering	inginerie geodezică și cadastru
water resources engineering	ingineria resurselor de apă
construction engineering	ingineria construcțiilor
length	lungime
width	lățime
height	înălțime
depth	adâncime
weight	greutate
circumference	circumferință

UNIT 2: JOBS AND PROCESSES IN CONSTRUCTION

1. **Vocabulary - Professions in Civil Engineering.** Provide a Romanian translation for the following words:

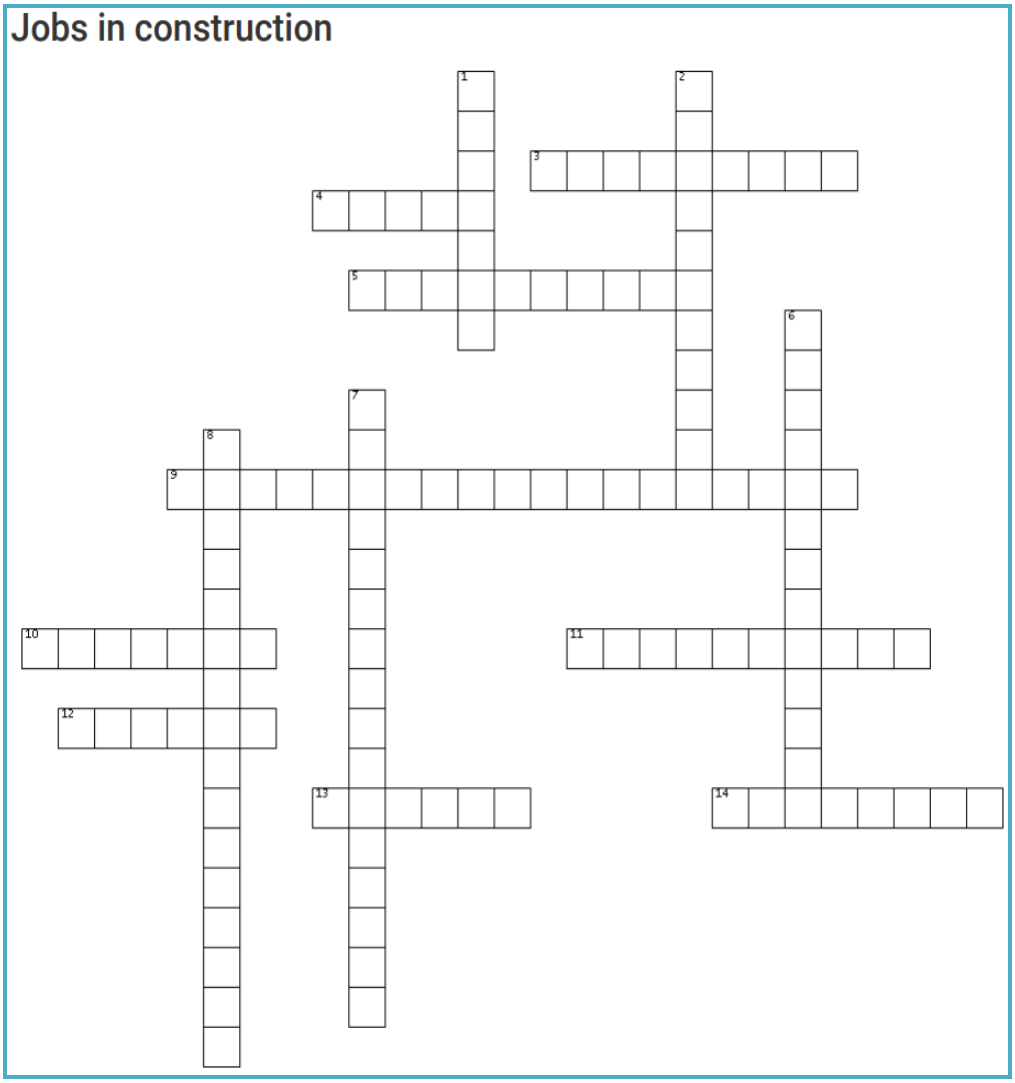
   construction worker _____; surveyor _____;
   tile setter _____; mason_____;
   concrete finisher _____; ironworker _____;
   crane operator _____; plumber _____;
   carpenter _____; painter _____;
   construction manager _____; welder _____;
   forklift operator _____; electrician _____;

2. 🎧 **Vocabulary – Pronunciation.** Listen and pronounce the jobs discussed in Exercise 1.

URL: https://tinyurl.com/ksywka3u

3. **Vocabulary- Comprehension (Jobs in Constructions).** Use the terms from Exercise 1 and match them with the job description.

   Note: Some rows and columns contain **two words**.
   Example: *Number 9: Correct answer- CONSTRUCTION MANAGER*



Across

3. A person whose job is making and repairing wooden objects and structures.

4. A person who builds using stone, or works with stone.

5. A person who installs tiles to floors, walls, or ceilings – 2 words.

9. Overseeing the planning, design and construction of a project, from its beginning to its end – 2 words.

10. A person whose job is to fit and repair things such as water pipes, toilets, etc.

11. A person who works in the iron-working industry. He/she assembles the structural framework in accordance with engineered drawings and installs the metal support pieces for new buildings.

12. A person who works in the construction industry, especially one engaged in manual work.

13. A person whose job is welding metal.

14. A person whose job is to examine and record the details of a piece of land.

Down

1. A person who applies paint during different construction projects.

2. A person whose job is to connect, repair, etc. electrical equipment.

6. A person who operates a crane (a big machine with a long arm that is used by builders for lifting and moving heavy things) - 2 words.

7. A person whose main job is to operate a forklift (a self-propelled machine for hoisting and transporting objects by means of steel fingers inserted under the load) - 2 words.

8. A skilled person who works with concrete by placing, finishing, protecting and repairing concrete in engineering and construction projects – 2 words.

(Definitions taken and adapted from: https://tinyurl.com/2p3m37p4)

4A. Reading. Read the text and choose the right answer for the given context.

Construction offers tons of opportunities for workers at many stages in their **careers/carriers**. In today's economy, the salaries for people working in construction are **appealing/appalling,** as they gradually increased over time. **Nowdays/ Nowadays** there is a high demand for specialised **workforce/workpower**.

Construction Project Managers: If you like the view from the top, this is one of the best careers in construction for you. Project managers (PMs) are **reponsable/responsible** for overseeing various aspects of a project from start to finish, including planning, coordination and implementing. PMs need excellent problem-solving skills, the ability to handle **high-pressure/low-pressure** situations, solid organisational and budgeting skills, and strong **leadership/leader** qualities.

Plumber: In the construction industry, typically, plumbers **instal/install** and repair water supply lines, waste disposal systems, appliances, and fixtures for residential, commercial and even industrial projects. These contracts are usually long-term and add a steady and consistent **stream/creek** of income.

Electricians: Similar to plumbers, electricians must be licensed and **certificated/certified**. Before that, in **adition/addition** to a diploma, electricians must undergo technical school to get **hands-on/ hands-off** training and then a 4-5 year apprenticeship program.

Ironworkers: While a career as an ironworker can be dangerous and full of risks, **they/there** are plenty of positive benefits that make it a fulfilling career for many. Ironworkers install metallic structures such as **steal/steel** to form and support buildings and other infrastructure projects like roads and bridges. If you have those skills, you'll find that ironworking is **quiet/quite** rewarding.

Civil Engineers: If you love the concepts of construction but don't love being out on the **jobsight/jobsite**, civil engineering is a great career path to explore, as people in this **role/roll** spend a lot of time inside a trailer or **office/ofice.**

(Text taken and adapted from https://tinyurl.com/wspn8m9d)

4B. Vocabulary – Useful terms: Match the words with their definition.

A. *A system for the collection, transmission, treatment, storage and distribution of water from source to consumers.*	**1.** (to) oversee
B. *The collection, processing and recycling of the waste materials of human society.*	**2.** water supply lines
C. *A strong, hard magnetic silvery-grey metal, much used as a material for construction and manufacturing.*	**3.** long-term
D. *An arrangement in which someone learns an art, trade, or job under another.*	**4.** waste disposal systems
E. *A piece of equipment or funiture which is fixed in position in a building or vehicle.*	**5.** appliances
F. *To achieve or realize (something desired, promised, or predicted).*	**6.** fixtures
G. *Money received, especially on a regular basis, for work or through investments.*	**7.** income
H. *A device or piece of equipment designed to perform a specific task.*	**8.** apprenticeship
I. *Occurring over or involving a relatively long period of time.*	**9.** (to) fulfill
J. *To supervise (a person or their work), especially in an official capacity.*	**10.** iron

(Taken from: https://tinyurl.com/mtv5sy4j; https://tinyurl.com/bde9fy84; https://tinyurl.com/2p3m37p4)

5. Writing. Work in groups of two. Imagine that you are renovating your kitchen. Everything needs to be changed: the floor and wall tiles, the plumbing, the electrical sockets and lighting fixtures. You also need to apply a new coat of paint to the walls and check the gas installation. What type of professionals do you need to hire in order to get the job done? You can check Exercise 3 which provides details on the tasks undertaken by different specialized workers. Mention the main tasks of every profession needed for this project. Below you will find a list of all the aspects that need to be completed.

-masonry and plastering works; -installing wall and floor tiles; -installing electrical fixtures and appliances (such as lighting fixtures and sockets); -repainting the walls; -checking the water pipes, installing various plumbing fixtures, gas installation;	

Write your answer in no more than 120 words.

6. **Vocabulary - Construction processes.** There are many construction stages when erecting a structure. Look at the terms and the definition provided for each of them and provide a Romanian translation of the construction processes**.**

CT processes	Definition	Romanian Translation
1. **Surveying**	A preliminary step in construction works is to examine the area of land in order to decide where the buildings will go.	
2. **Digging/ Excavation**	This process is mainly done with the help of various machines and tools designed for earthmoving, i.e. dozers and trucks.	
3. **Trenching**	A construction method that involves digging a narrow trench in the ground for the installation, maintenance, or inspection of pipelines or cables.	
4. **Leveling**	Before building a foundation, the soil must be made flat or leveled with the help of various machines such as graders.	
5. **Compaction**	To eliminate air pockets and add density to the soil, you will need to compact it. This process is mainly achieved with the help of various machines such as drum roller compactors.	
6. **Foundation pouring**	This relates to the element of structure which connects it to the ground, transferring loads from the structure to the ground.	
7. **Walling**	An upright (vertical) structure of masonry, wood, plaster, or other building material serving to enclose, divide or protect an area of a building.	
8. **Plastering**	To cover a wall or ceiling with wet plaster or a similar substance.	

CT processes	Definition	Romanian Translation
9. **Setting/laying tile**	A flat or curved piece of clay, stone, or concrete used especially for roofs, floors, or walls and often for ornamental work.	
10. **Installation of metal structures**	Mounting and assembling various metal components in order to obtain a sound structural frame for the building project.	
11. **Concrete pouring**	This is often used for floors and for walling for commercial, residential and industrial buildings.	
12. **Woodworking**	This refers to the installation of the wooden parts of a house or room, for example, the doors, the frames around the windows,etc.	
13. **Insulation**	The act of covering something to stop heat, sound, or electricity from escaping or entering.	
14. **Roofing**	All the processes involved in raising a rooftop such as removing the old roofing and adding new tiles.	

7. Classroom activity. **The Guessing Game**

Work in **groups of 5**.

Each student will be asked to **come in front of the classroom**.

He/she will receive a sheet of paper from the teacher containing a vocabulary word from the first two Units.

The student will have **1 minute** to (1) **define** the word (in English), (2) **mime it**, or (3) **draw it.**

His/her team members will get **two points** if they can guess the word.

During this time, the other teams can try and guess the word and **write it on a piece of paper before the time is up**.

If they have guessed correctly, the team will receive **1 point** for the effort.

The team with the most points at the end of the game will be declared the winner.

Unit 2: Additional exercises

8. Writing. What types of professionals are needed to build skyscrapers? Write your answer in approximately 100 words (or less).

9. Writing. Can you mention some construction processes that are conducted when building a stadium? Write your answer in approximately 100 words (or less).

Key words: Glossary of Terms (UNIT 2)

English	Romanian
appliances	aparate
apprenticeship	ucenicie/practică
beam	grindă
carpenter	tâmplar/dulgher
ceiling	tavan
compaction	compactare
concrete finisher	finisor beton
construction manager	manager în construcții/ diriginte de șantier
construction worker	muncitor în construcții
crane operator	operator de macara
electrician	electrician
excavation	excavare
fixtures	corpuri
floor	podea
forklift operator	operator de stivuitor
insulation	izolație
iron	fier
ironworker	lăcătuș montator structuri metalice
jobsite	șantier
laying tile	montare faianță
lighting systems	sisteme/instalații de iluminat
mason	zidar
painter	zugrav
plastering	tencuială
plumber	instalator
sockets	prize
surveying	topografiere
surveyor	topograf
tile setter	faianțar/ montator (gresie, faianță, țiglă)
trenching	tranșare
walling	zidărie
waste disposal systems	sisteme pentru eliminarea deșeurilor
water supply lines	linii de alimentare cu apă
welder	sudor
woodworking	prelucrarea lemnului

UNIT 3: CONSTRUCTION TOOLS

1. **Classroom discussion.** Take a minute and think of some tools (used in civil engineering) that you already know in English. Write them down and discuss them with your teacher.

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2. **Vocabulary- Construction tools.** There are many different tools that can be used in civil engineering. Below, you can find a selection of tools. After reading the information, use online resources to provide an English definition for each of them and the Romanian translation for the tools.

Tools (in English)	Definition	Romanian Translation
1. **Toolbox** (toolkit, tool chest, workbox)		
2. **Scissors**		
3. **Hammer**		
4. **Claw Hammer**		
5. **Mallet**		

Tools (in English)	Definition	Romanian Translation
6. **Nail**		
7. **Axe**		
8. **Flashlight**		
9. **Screwdriver**		
10. **Nut**		
11. **Pliers**		
12. **Level**		
13. **Tape Measure**		
14. **Crowbar**		
15. **Handsaw**		
16. **Circular Saw**		

Tools (in English)	Definition	Romanian Translation
17. **Chainsaw**		
18. **Cordless Drill**		
19. **Caulking gun**		
20. **Wrench**		
21. **Duct tape**		

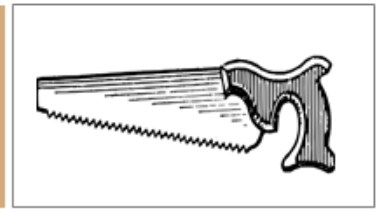
3. 🎧 **Vocabulary – Pronunciation.** Listen and pronounce the tools discussed in Exercise 2.

URL: https://tinyurl.com/2p83fsvw

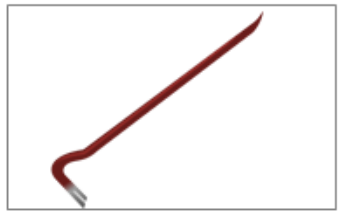
4. **Vocabulary - Construction Tools.** Write down (in English), the name of the tools shown in the pictures below.

A._____; B._____;

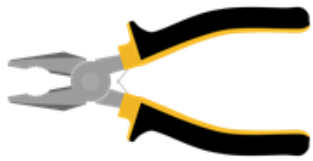
C._____; D._____;



E._____; F._____;



G._____; H._____;



I._____; J._____;

5. Translation - Hand and power tools. Translate the texts from English to Romanian.

A. ***Hand and power tools are*** *a part of our everyday lives and help us to easily perform tasks that* ***otherwise*** *would be difficult or impossible. However, these simple tools can be* ***hazardous****, and have the potential for causing severe injuries when used or* ***maintained improperly****.*

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B. *At some point, most people will use even the most basic hand tools—from hanging a picture to installing* ***shelves****, most of us will need a simple tool kit at home. But even the most* ***seasoned professional*** *might have questions about specific tools or might be in the market for a collection of* ***must-haves*** *to keep in his* ***toolbox****. So, what do you need?*

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C. *Different types of hand tools include* ***screwdrivers****,* ***hammers****,* ***pliers****, and* ***wrenches****. Depending on your needs, each of these has a different use, and most are not interchangeable. Knowing what hand tools are and their intended purpose is essential for anyone looking to build or repair nearly anything.*

_____
_____
_____
_____
_____
_____

(Text A: Taken and adapted from: https://tinyurl.com/4zddmmbd;Texts B and C were taken and adapted from: https://tinyurl.com/4mzpmhbd)

6. Phrasal verbs are also used in the field of Civil Engineering. Using online resources, search for the terms provided here and make sentences with the phrasal verbs.

a. to carry out

_____

b. to run (it) by someone

_____

c. to take on something

_____

d. to call off something

_____

e. to pull down something

_____

f. to fence off something

_____

h. to draw up something

_____

(Source: https://tinyurl.com/2dk2ap2u)

7. Reading. Read the text and answer the questions**.** Look up the words in **bold** or **ask your teacher** about them before starting the exercise.

Types of Tools

Many hand tools are common enough that even if someone doesn't know what a tool is called, they probably know what it is and how to use it. Let's look at some of the more indispensable hand tools and information on the many varieties.

1. Screwdrivers

One of humankind's most time and labor-saving inventions, the humble screwdriver has made nearly every living human being's life a little better. Screws hold just about anything better than a nail does, so it makes sense that the screwdriver is a keystone of civilization. While there are many varieties, there are three main types of screwdrivers.

Probably the most common screwdriver, the Phillips-head variety is used to drive screws with a plus-shaped indentation on their heads. Having two blade-like structures at right angles allows the Phillips-head screwdriver to bite the screw more securely, preventing the tool from slipping off to one side.

Nearly as common as the Phillips-head, the slotted, or flathead, screwdriver is about as basic as a screwdriver can be. The tool's flat tooth fits into a slot on the screw and helps the user turn it with much more ease than would be possible with fingers.

A breed of specialty screwdriver, the star screwdriver works on screws with a matching star design. These are often used for security purposes: the idea being to prevent a thief with a screwdriver from having easy access. As a star screwdriver is unusual, your average criminal probably doesn't have a complete set of these in his cat burglar bag.

2. Hammer

The earliest tools man created were hammers of a sort, and while technology has made them lighter and stronger, there isn't a great deal of technological advancement available for a heavy thing you use to hit other things with.

Most hammers have a front and a back, including the nail-hitting side and the nail-removing side. That two-pronged claw on the back of nearly every hammer you've ever seen is vital, as it allows you to remove a nail without damaging the surface it's nailed into.

A robust and heavy-duty tool, a sledgehammer has a handle as long as an ax's and is used almost exclusively for breaking things, such as concrete, rocks, and brick.

3. Level

There are levels that use lasers, and those are neat and do the job, but all a level really needs is an air bubble in a liquid. These levels feature a clear tube with liquid and a bubble inside. Line the bubble up between the lines marked on the tube, and you know your surface is level. Longer levels are for larger projects, perhaps building trusses for house construction, and there are combination levels/squares that aid in calculating the right angles.

(Text adapted from: https://tinyurl.com/4mzpmhbd)

1. What are the three main types of screwdrivers mentioned in the text?

_____
_____
_____
_____

2. Identify at least one difference between a regular hammer, a claw hammer and a sledgehammer.

3. What are longer levels used for?

Unit 3: Additional exercises

8. Writing. What's in your toolbox? Mention some of the essential tools that you have in your household. Write your answer here. (100 words)

9. Writing. Make a list of power and manual tools that were not discussed during the lesson. Write them in Romanian. Additionally, you can also provide the English translation for the words.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Key words: Glossary of Terms (UNIT 3)

English	Romanian
to seal	a astupa/a închide
to build	a construi
to drill	a găuri
to bind	a lega/ a îmbina
to measure	a măsura
to lift	a ridica
to pierce	a străpunge
to cut	a tăia
sledgehammer	baros
level	boloboc, nivelă, nivelmetru
cordless drill	bormașină fără fir/cu acumulator
hammer	ciocan
claw hammer	ciocan cu gheară
mallet	ciocan de lemn/cauciuc
pliers	clește/patent
nails	cuie
chisel	daltă
chainsaw	drujbă
circular saw	fierăstrău circular
handsaw	fierăstrău manual
scissors	foarfecă
flashlight	lanternă
hazardous materials	materiale periculoase/nocive
nut	piuliță
shelves	rafturi
crowbar	rangă
tape measure	ruletă
washer	șaibă
screwdriver	șurubelniță
flathead/ slotted screwdriver	șurubelniță cu cap plat
Philips-head screwdriver	șurubelniță în cruce
star screwdriver	șurubelniță stea/ în stea
axe	topor
toolbox	trusă de scule
power tools	unelte actionate electric
hand tools	unelte manuale

UNIT 4: TYPES OF BUILDINGS AND STRUCTURAL COMPONENTS

1. Vocabulary - Classification of buildings in Civil Engineering. Match the description (A-I) with the type of building (1-9).

A. *Buildings that are mainly designed for residents. These constructions have at least one* ***sleeping facility.*** *Examples: apartments, hotels, hostels,* ***lodgings****.*	**1.** Storage buildings
B. *Buildings made for educational purposes. Examples: schools, colleges,* ***day care facilities****.*	**2.** Mercantile buildings
C. *Buildings used for medical treatment, penal or correctional detentions. Examples: hospitals, jails, mental asylums.*	**3.** Assembly buildings
D. *Buildings where various groups of people meet for recreation, social, religious, political, civil, travel, etc. Examples: theatres, cinemas, museums.*	**4.** Institutional buildings
E. *These buildings are used to conduct various types of business. Examples:* ***offices****, banks,* ***libraries****,* ***courthouses****.*	**5.** Business buildings
F. *Used for selling various* ***goods****. Examples: small shops, stores,* ***markets****.*	**6.** Hazardous buildings
G. *Types of buildings dealing with various industrial processes. Examples:* ***assembly plants****,* ***dry cleaning plants****,* ***power plants****.*	**7**. Educational buildings

H. *Buildings in which material is stored or* ***sheltering*** *facilities are provided for different types of goods. Examples:* ***warehouses****,* ***stables****,* ***hangars****,* ***garages****.*	**8.** Residential buildings
I. *Used for storage of materials and chemicals which are highly dangerous to humans or* ***hazardous*** *to the environment.*	**9.** Industrial buildings

(Text taken and adapted from https://tinyurl.com/3u3y8x43)

2. Vocabulary - Types of constructions. Look at the pictures and write down the type of building that they represent

A. _____ B. _____

C. _____ D. _____

E. _____ F. _____

G. _____ H. _____

3A. Vocabulary- Types of Buildings. Translate the words in bold found in the definitions provided above.

1. sleeping facility_____; 2. lodgings_____;
3. day care facilities_____; 4. offices_____;
5. courthouses_____; 6. libraries_____;
7. goods_____; 8. markets_____;
9. raw material _____; 10. assembly plants_____;
11. dry-cleaning plants_____; 12. power-plants _____;
13. sheltering_____; 14. warehouses _____;
15. stables_____; 16. hangars _____;
17. garages _____; 18. hazardous_____;

3B. 🎧 **Vocabulary–Pronunciation.** Listen and pronounce the words discussed in Exercise 3A.

URL: https://tinyurl.com/2p833hp3

4. Reading. Read the text and answer the questions**.**

Constructions in the field of civil engineering include a variety of works, such as buildings, roads, railways, bridges, dams, water supply systems, sewerage, power lines, etc. Of all these, buildings are the most important as they fulfill multiple purposes and require a wide range of engineering and construction processes.

Depending on their purpose and utility, buildings can be mainly divided into 4 categories: civil buildings such as housing, socio-cultural buildings (schools, theatres, gyms, hospitals, dormitories, kindergartens, etc.); administrative-commercial buildings such as post-offices, shops, or town halls); industrial buildings such as factories and plants, warehouses, garages, etc.) and agro-zootechnical buildings such as silos, stables, barns and greenhouses.

Every building is made up of a series of construction elements, which have certain specific features, are executed according to certain rules and play a crucial part in the whole construction process. Some of these elements include the foundation, the body of the building and the roof.

The role of the foundation is to take over the loads transmitted by the body of the building and pass them on to the foundation ground so that the ground can withstand this load in good conditions. The elevation (or body of the building) comprises all the rooms that make up the building and are located above ground level. This part consists of walls and floors, partitions, stairs, etc. The roof is the part of the building that protects the building from water infiltration. To prevent water from entering, the roofs are provided with a waterproof cover.

For the multi-storey residential buildings, industrial and agro-zootechnical buildings, resistance structures are used for taking over and transmitting the loads to the foundations and also for ensuring the stability of the construction. The resistance structure can be made out of reinforced concrete, metal, or precast concrete. (Taken and adapted from https://tinyurl.com/3wa4weak)

4A. After reading the text, provide an answer to each question.

A. Mention some types of constructions that are made in the field of civil engineering.

_____

_____

_____

_____

_____

_____

B. How can buildings be classified on account of their purpose and utility?

_____

_____

_____

_____

_____

_____

C. What are the main 3 construction elements that are part of most building projects?

_____

_____

_____

_____

_____

_____

_____

D. Mention at least 2 constitutive building structures needed for the body of the building.

_____

_____

_____

_____

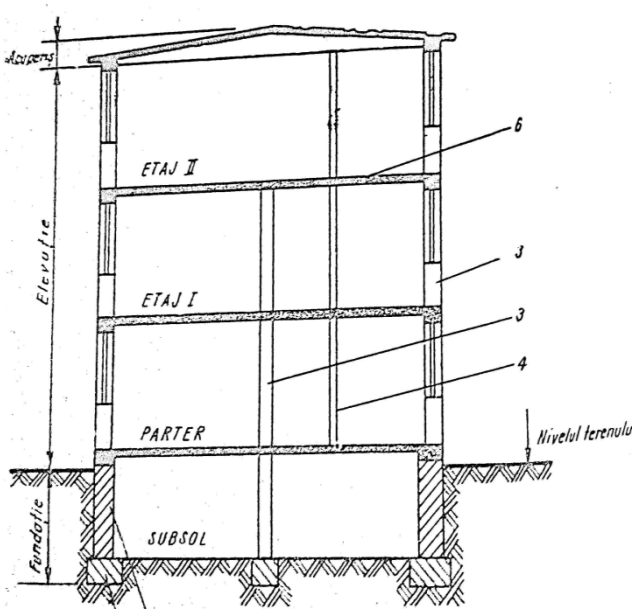
_____

_____

_____

5. Imagine you are delivering a presentation on the main constitutive elements of a building. Look at the picture below, and try to use the English equivalent of the words below to describe the structure as best as possible. Prepare your written notes in the space provided below.

acoperiș, etaj, elevație, fundație, nivelul terenului, subsol, ziduri de rezistență, zid despărțitor, planșeu.



6. Speaking Exercise- Classroom discussion. Take a moment to think about the next question:

If you had the possibility of coordinating a building project, what type of building would you choose? Justify your answer.

You have two minutes to write down key aspects followed by a discussion with the teacher.

Unit 4: Additional exercises

7. Classroom Exercise. Work in groups of 2-3 students. Think about the following questions and provide an answer to them.

A. What types of building materials would you use if you would like to make an apartment building? What about an office building?

B. What types of machines would you use for erecting a multi-storey building? What about a stadium?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

C. What types of workers would be needed to build a warehouse? What specialized personnel would be needed to build a mall?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Key words: Glossary of Terms (UNIT 4)

English	Romanian
assembly buildings	clădiri destinate diferitelor tipuri de adunări
assembly plants	uzine de asamblare
barn	hambar
basement	subsol
business buildings	clădiri de afaceri
courthouse	tribunal
day care facilities	grădinițe
dormitory	cămine
dry-cleaning plants	instalații de curățare chimică
educational buildings	clădiri de învățământ
elevation	elevație
elevation (body of the building)	corpul unei clădiri/elevația
floor	etaj
floor	planșeu
garage	garaj
goods	bunuri
greenhouse	seră
gyms	săli de sport
hazardous	periculos/nociv
hazardous buildings	clădiri ce conțin materiale periculoase/nocive/toxice
industrial buildings	clădiri industriale
institutional buildings	clădiri instituționale
kindergarten	grădiniță
library	bibliotecă
load-bearing walls	ziduri de rezistență
lodgings	spații de cazare/locuințe
market	piață
mercantile buildings	clădiri mercantile/comerciale
multi-storey	clădire cu mai multe etaje
offices	birouri
post-office	oficiu postal
power-plants	central electrice
precast concrete	prefabricate din beton

English	Romanian
raw material	materie primă
residential buildings	clădiri rezidențiale
roof	acoperiș
separating wall	zid despărțitor
silo	siloz
sleeping facility	locuri/spații de dormit
stable	grajd
storage buildings	clădiri de depozitare
to shelter	a adaposti
town hall	primărie

UNIT 5: BUILDING MATERIALS AND MEASUREMENTS IN CIVIL ENGINEERING

1A. Vocabulary - Building materials. Write the English equivalent for the following building materials:

cărămizi: _____; piatră: _____;
calcar: _____; ciment: _____;
cherestea: _____; nisip: _____;
mortar: _____; beton: _____;
aluminiu: _____; cupru:_____;
sticlă: _____; vopsele: _____;
adezivi: _____; bitum:_____;
plastic: _____; beton armat:_____;
material izolator _____; polistiren_____;
argilă_____; oțel _____;

1B. 🎧 **Vocabulary – Pronunciation.** Listen and pronounce the words from Exercise 1.

URL: https://tinyurl.com/2dtxjhec

2. Vocabulary – Building materials. Match the words with their definition:

A. *Concrete in which metal (such as steel) is embedded so that the two materials act together in resisting forces.*	**1**. Varnishes
B. *Commercial iron that contains carbon in any amount up to about 1.7 percent as an essential alloying constituent and is distinguished from cast iron by its malleability and lower carbon content.*	**2.** Mortar
C. *A silver-white metallic chemical element with atomic number 13 that has good electrical and thermal conductivity, high reflectivity, and resistance to* oxidation.	**3.** Copper
D. *A rigid transparent thermoplastic that has good physical and electrical insulating properties and is used especially in molded products, foams and sheet materials.*	**4.** Reinforced concrete
E. *A plastic building material (such as a mixture of cement, lime, or gypsum plaster with sand and water) that hardens and is used in masonry or plastering.*	**5.** Timber
F. *A metallic chemical element that is easily formed into sheets and wires and is one of the best-known conductors of heat and electricity.*	**6.** Bricks
I. *A liquid preparation that when applied to a surface dries to form a hard lustrous typically transparent coating.*	**7**. Steel
H. *Wood that is suitable for building or for carpentry.*	**8.** Aluminum

(Definitions taken and adapted from https://tinyurl.com/2p3m37p4)

Length		Volume		Weight	
English	**Romanian**	**English**	**Romanian**	**English**	**Romanian**
Millimeter (mm)	Milimetru	Liter (l)	Litru	Gram (g)	Gram
Centimeter (cm)	Centimetru	US gallon	Galon	Pound (Lb)	Livră
Inch (in)	Inch	UK gallon	Galon	Kilogram (Kg)	Kilogram
Foot (ft)	Picior	Cubic yard (yd^3)	Yard Cubic	Ton (t)	Tonă
Yard (yd)	Yard	Cubic Meter (m^3)	Metru Cub		
Meter (m)	Metru				
Square feet (ft^2)	Picioare pătrate				
Square meter (m^2)	Metru Pătrat				
Kilometer (km)	Kilometru				
Mile (mi)	Milă				

Figure 2. Some Common Units of Measurement

3. **Vocabulary and Comprehension.** Look at the table above. Use the correct unit of measurement for the following building materials. Avoid using abbreviations.

a) one unit of measurement for **cement** is _____;

b) one unit of measurement for **sand** is _____;

c) one unit of measurement for **polystyrene** is _____;

d) one unit of measurement for **varnishes** is _____;

e) one unit of measurement for **steel** is _____;

f) one unit of measurement for **paints** is _____;

4. Writing Exercise - Building materials.

To buildingconstruct@gmail.com x
Cc dan.nistor@buildct.com

Subject: Listă achiziție materiale de construcții

Bună ziua,

Vă rugăm să aprovizionați materialele menționate în lista de mai jos, necesare pentru începerea construcției clădirii de pe strada Mihăileni, nr. 228.

-10 saci mortar (25 kg);
- 100 de litri, vopsea pentru interior și exterior; culoare- ALB;
- 250 de scânduri (2000 x 40 x 20 mm);
- 360 de cărămizi (375 x 250 x 238 mm);
- 10 litri de diluant universal;
- 15 litri lac protector pentru lemn;
- gresie patrată (60 x 60 cm), culoare- MARO; 30 de m^2
- polistiren (1000 x 500 x 50 mm), 20 m^2;
- o tonă de bare oțel dreptunghiulare (6000 x 50 x 50 mm)

New words
Scânduri- planks;
Diluant- paint thinner;
Gresie- tile;

Cu stimă,
Ing. Sava Alexandru

4A. Using the technical vocabulary presented during this lesson, translate the email from Romanian to English. Avoid using abbreviations for the units of measurement. For the English equivalent of the technical terms, check the answers from exercise 1. For other technical terms, check the table located in the box above.

_____

_____

_____

_____

_____

5. Reading. Read the following text and answer the questions

The history of architecture is also the history of building materials. Studying ancient building materials enables us to understand how far our society has come, and how criteria for choosing these materials have changed over time.

In Antiquity, the only building materials available were what nature provided. When mankind first formed into tribes, people tended to build small villages of simple wooden huts roofed with animal pelts. Back in the Paleolithic period, these were elementary structures, offering minimal protection from the weather. During the Neolithic period, as climatic conditions worsened, man was forced to exploit the main building material around him – wood – in a variety of ways, using it to build more solid huts with real roofs, and structures raised on piles, of which traces have been found. It was only at the end of the Bronze Age, around the third millennium BC, that stone started to be seriously taken into consideration as a construction material: we know this from edifices such as Stonehenge and of course, the Pyramids, which were made out of extremely heavy blocks of granite.

One of the best-preserved monuments of ancient Rome, the Pantheon was built around 25 B.C. Made primarily from bricks and concrete, the Pantheon measures 142 feet in diameter and is the oldest unreinforced concrete building in the world. Along with technological advancements came new technologies and techniques for building structures. One such example is the Louvre pyramid in Paris. Designed by I.M. Pei, the pyramid is made entirely out of glass segments and metal poles, reaching a height of 21.6 meters. Metals were also used extensively during the industrial and post-industrial eras. The Eiffel Tower is a great example of a metal construction as it is comprised of 18,000 pieces of iron and approximately five million bolts.

Modern building materials allowed architects and engineers to let their imaginations run wild and continuously strive to reach new heights with ambitious designs. Among these, we can find the Burj Khalifa building in Dubai, the highest man-made structure in the world. To reach the staggering height of 828 meters, the main material used to build it was reinforced concrete due to its durability and resistance to tensile strength.

All of these engineering marvels are proof that engineers and architects are always trying to push the limits of their respective fields of work. Who knows what the future will have in store for us?

(Adapted from: https://tinyurl.com/4dzd4724)

5A. Text Comprehension. Read the text and answer the following questions.

1. What were the main building materials used in antiquity?

_____

2. What is the oldest unreinforced concrete building that still exists today?

_____

3. Who designed the Louvre pyramid?

_____

4. Approximately how many bolts were used to build the Eiffel Tower?

_____

5. What is the tallest man-made building in the world?

_____

5B. Testing your vocabulary

1. What was the main building material used for Stonehenge and the famous Egyptian pyramids?

_____

2. What was the main building material used to design the Louvre pyramid?

_____

3. What was the main building material used to design the Burj Khalifa building?

_____

6. Name two famous buildings that primarily used the following building materials.

stone: _____ and _____;

reinforced concrete: _____and _____;

bricks: _____ and _____;

metal: _____ and _____;

glass: _____ and_____;

7. Writing. Translate the following paragraphs (from English to Romanian)

A. *Building material is any material that can be used for construction purposes. It commonly includes* ***wood***, ***concrete***, ***steel***, ***cement***, ***aggregates***, ***bricks***, ***clay***, ***metal***, *and so much more. In the old times, people have been using bricks, wood, or* ***straw***. *But in this modern age, engineers have learned to* ***mix and match*** *the right materials to produce* ***higher quality structures***. *Of course, the choice is always based on the client's budget and the effectiveness of the materials in building projects.*

_____

_____

_____

_____

_____

_____

_____

B. *Building materials can be further classified and categorised in accordance with their properties, usage, price, effectiveness and reliability. Used for several centuries,* ***timber****,* ***lime****, bricks and stones can be regarded as traditional building materials. Ferrous metals such as* ***steel*** *and* ***iron****, as well as alloys like* ***aluminum*** *are often used to make both commercial and residential buildings.*

C. *Other materials used for constructions are obtained through a mixture of* ***sand****,* ***cement****,* ***lime****,* ***mud*** *and water and are known as* ***mortars****.* ***Concrete*** *is also a main building material and is produced in a variety of c****ompositions****,* ***finishes*** *and performance characteristics to meet a wide range of needs.*

_____
_____
_____
_____
_____
_____

D. *Nowadays,* ***glass****,* ***paints****,* ***varnishes****,* ***plastics****,* ***insulators*** *and* ***adhesives*** *are often used to complement traditional building materials in order to create cost-effective, modern and practical structures.*

_____
_____
_____
_____
_____
_____
_____
_____

(Taken and adapted from: https://tinyurl.com/4vw7p8wm)

Unit 5: Additional exercises

8. Writing. What kind of materials could be used to build a long bridge? Would you use other materials for a smaller, pedestrian bridge? Write your answer in 10 -15 lines.

_____
_____
_____
_____
_____
_____
_____
_____

9. **Writing.** What kind of materials could be used to build a forest cabin/lodge? Write your answer in 10-15 lines.

Key words: Glossary of Terms (UNIT 5)

English	Romanian
adhesives	adezivi
aggregates	agregate
brass	alamă
aluminium/aluminum	aluminiu
clay	argilă
silver	argint
gold	aur
concrete	beton
bittumen	bitum
reinforced concrete	beton armat
lime or limestone	calcar
brick/bricks	cărămidă/cărămizi
timber	cherestea
cement	ciment
chrome	crom
copper	cupru
iron	fier
insulator	material izolator
mortar	mortar
steel	oțel
stone/stones	piatră/pietre
plastic	plastic
polystyrene	polistieren
glass	sticlă
paints	vopsele
finishes	finisaje
embedded	integrate/incorporate
cast iron	fontă
molded products	produse turnate
sheet materials	materiale (subțiri) de tablă
gypsum plaster	tencuială de ghips
masonry	zidărie
carpentry	tâmplărie
moist	umed
coating	acoperire/înveliș

planks	scânduri
tile	gresie
paint thinner	diluant
granite	granit

UNIT 6: PROPERTIES OF BUILDING MATERIALS

1. **Speaking - Preliminary talks**. Describe some notions that characterise some main mechanical properties of building materials.

_____

_____

_____

_____

_____

_____

2. **Vocabulary - Properties of building materials.** The purpose of this exercise is to introduce some main mechanical properties of building materials. Match the terms (in Ro) with their English equivalents.

Rezistență la rupere	Hardness
Rezistență la curgere	Fatigue
Elasticitate	Compression
Duritate	Resilience
Rigiditate	Flow resistance
Tenacitate	Rigidity
Rezistența la oboseală	Breaking strenght
Rezistența la compresiune	Elasticity

3. 🎧 **Vocabulary–Pronunciation.** Listen and pronounce the words found on Exercise 2.

URL: https://tinyurl.com/5ckva98n

4. Vocabulary. Use the mechanical properties from exercise 2 and link them with the definitions provided below.

A. The ability of a material to resist to the penetration and scarring by another material.

_____

B. The property of some deformed bodies to recover, at least partially, their initial form after the suppression of the force which provoked the deformation.

_____

C. The behavior of materials subjected to cycles of repeated stress or deformation that cause a deterioration of the matter, resulting in a progressive fracture.

_____

D. The effect of squeezing, i.e. particles within a material being pushed closer together.

_____

E. The power of a material to withstand shocks.

_____

(Definitions taken from: Kurtz, Jean-Paul. 2004. *Dictionary of Civil Engineering*. New York: Kluwer Academic/Plenum Publishing)

5. Translation. Translate from English to Romanian

A. *The **mechanical properties** of a material are defined as those properties that influence the material's reaction to applied **loads**. Mechanical properties are used to determine how a material would behave when applying different types of **stress** to it.*

_____
_____
_____
_____
_____
_____

B. *The measure of the average amount of force exerted on a building material is known as stress. This shows the intensity of the total internal forces acting within a body as a reaction to external applied forces and **body forces**. The force or weight put on a structure is known as a load.*

_____
_____
_____
_____
_____
_____
_____
_____

C. *The properties of building materials can be classified as **physical**, **chemical** and **mechanical** properties. Physical properties refer to properties such as **size**, **state of matter** (solid, gas, or liquid), **density**, **mass**, **strength**, or color while mechanical properties relate to how a material reacts when forces are applied to it.*

_____
_____
_____

_____

_____

_____

_____

_____

_____

_____

_____

D. *Being an engineer, it is important to have the knowledge of chemical properties of engineering materials. Because most of the engineering materials* ***come into contact*** *with other materials and* ***react*** *chemically with each other. Due to this chemical reaction, they may suffer from chemical deterioration.*

_____

_____

_____

_____

_____

_____

_____

_____

_____

Physical and Chemical Properties of Building Materials	
English	Romanian
density	densitate
water absorption	absorbție de apă
weathering resistance	rezistență la factori de mediu
frost resistance	rezistență la îngheț
chemical resistance	rezistență la acțiunea agenților chimici
durability	durabilitate
heat conductivity	conductivitate termică

Figure 3. Physical and Chemical Properties of Building Materials

6. Vocabulary - Comprehension. Look at the table above. Use the English terms to fill in the blank spaces in the text.

All building materials are characterized by specific properties. Civil Engineers should have extensive knowledge of these properties in order to choose the best materials suited for the job. When choosing a material, different physical and chemical factors should be accounted for. If you want to build a long-lasting structure you need to account for the **1.** _____ of the chosen material. Climate also plays an important role in this process. If, for example, one needs to undertake a project in a cold climate, he/she should always account for the **2.** _____ of the materials if temperatures often fall below the freezing point.

Cold is not the only factor that needs to be taken into account. In fact, a civil engineer should be aware of all environmental factors and should choose materials with **3.** _____. These protect the integrity and durability of the structure regardless of the seasons, making sure it withstands the forces of nature. If the structure is built in a humid environment, **4.** _____ is also an important factor as some building materials can absorb and hold water while others can't. Furthermore, to reduce heat loss, civil engineers should always select materials with a very low **5.** _____. Understanding the properties of building materials is an essential part of becoming a civil engineer.

(Taken and adapted from https://tinyurl.com/32f852eu)

6A. Use an online dictionary and provide a translation for the words in bold found in the text. Write your answers here.

1. to emphasise _____; 2. stone axe _____;
3. alloy _____; 4. copper _____;
5. lead _____; 6. cast materials _____;
7. iron_____; 8. to usher in_____;
9. automotive _____; 10. to take for granted _____;
11. goods and services_____;

7. Reading. Read the text and answer the questions.

In some sense, materials science began about two million years ago when people began to make tools from stone at the start of the Stone Age. At that time, **emphasis** was on applications of materials, with no understanding of the microscopic origins of material properties. Nevertheless, the possession of a **stone axe** or other implements certainly was an advantage to an individual.

The Stone Age ended about 5000 years ago with the introduction of the Bronze Age in the Far East. Bronze is an **alloy** (a metal made up of more than one element), mostly composed of **copper** with up to 25% tin, and possibly other elements such as **lead** (which makes the alloy easier to cut), zinc, and phosphorus (which strengthens and hardens the alloy). Bronze is a much more workable material than stone, especially since it can be hammered, beaten, or **cast** into a wide variety of shapes.

Although bronze is still used today, about 3000–3500 years ago, ironworking began in Asia Minor. The Iron Age continues to the present time. The main advantage of iron over bronze is its lower cost, bringing metallic implements into the budget of the ordinary person. The Iron Age **ushered in** the common use of coins, which greatly improved trade, travel, and communications. Even today these three activities are strongly tied to materials usage. Throughout the Iron Age, many new types of materials have been introduced. Today we may **take for granted** the properties of glass, ceramics, semiconductors, polymers, composites, etc.

Nowadays, modern materials have had an immeasurable impact on our daily lives. New materials and processes have led to diverse products and applications: fiber optics; better computers; cheaper metal alloys to replace gold in electrical connections; more efficient LED, liquid crystal and plasma displays; many microelectronic applications. Materials development is important to many industrial sectors: aerospace, **automotive**, biological, chemical, electronic, energy, metals, and telecommunications. Indeed, economic growth is no longer linked to the production of basic materials, but rather to their use in **goods and services**.

(Taken and adapted from https://tinyurl.com/2p88pnf2)

7B. Read the text. Are these statements true (T) or false (F)?

A. The first tools used by human beings were made out of stone.

B. The chemical component of phosphorous in bronze makes the material easier to cut.

C. Iron was a main material used for manufacturing coins.

D. The use of modern materials led to significant economic and technological developments in a variety of industries.

7C. Text comprehension. Answer the following questions:

A. Name a few products and applications influenced by the emergence of modern materials.

_____
_____
_____
_____
_____
_____
_____
_____

B. Name some industrial branches that benefited from the use of modern materials.

_____
_____
_____
_____
_____
_____

C. What are the advantages of bronze as a building material when compared with stone?

_____
_____
_____
_____
_____

Unit 6: Additional exercises

8. Writing. What are the main aspects/features/properties that should be accounted for when designing a metallic bridge? You can select some of them from the words listed below.

density, weight, water absorption, weathering resistance, frost resistance, heat conductivity, chemical resistance, durability, hardness, fatigue, compression, resilience, flow resistance, rigidity, breaking strength, elasticity

Key words: Glossary of Terms (UNIT 6)

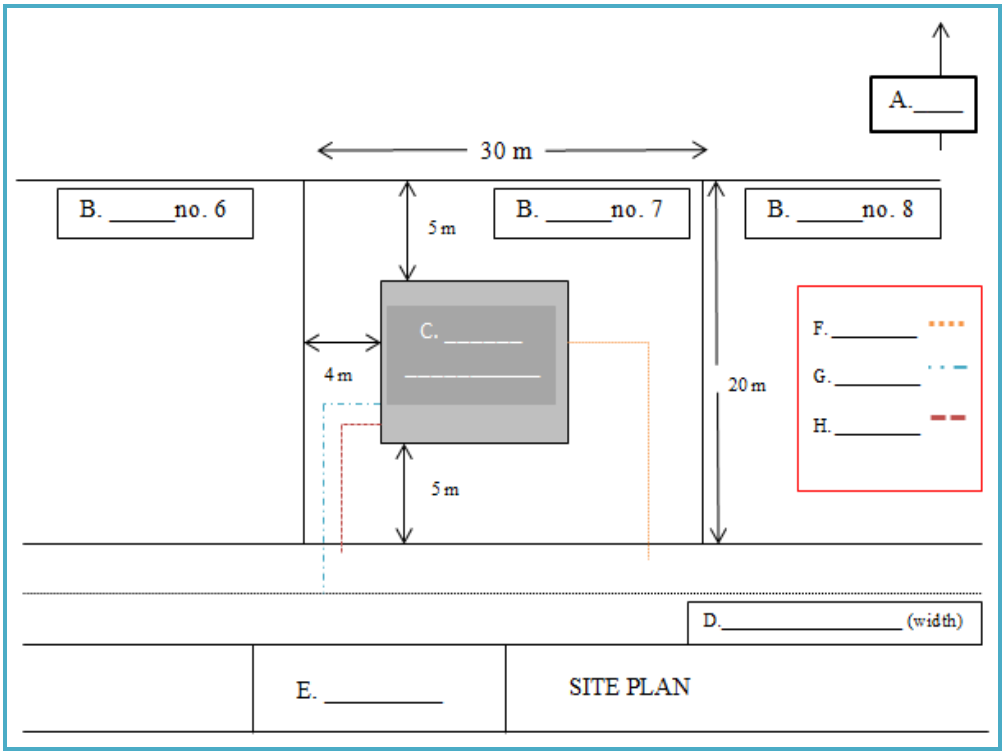
English	Romanian
alloy	aliaj
breaking strength	rezistență la rupere
cast materials	materiale turnate
chemical resistance	rezistență la acțiunea agenților chimici
compression	compresiune
copper	cupru
density	densitate
durability	durabilitate
elasticity	elasticitate
fatigue	rezistență la oboseală
flow resistance	rezistență la curgere
frost resistance	rezistență la îngheț
hardness	duritate
heat conductivity	conductivitate termică
iron	fier
lead	plumb
load	sarcină/încărcătură
resilience	tenacitate
rigidity	rigiditate
stress	solicitare
water absorption	absorbție de apă
weathering resistance	rezistență la factori de mediu

UNIT 7: THE CONSTRUCTION SITE

1A. Listening. How to draw a Site Plan. Watch the video by using the QR code or the link below.

URL:
https://www.youtube.com/watch?v=1a8pVuDNWC4

1B. Vocabulary. Using the information provided in the video, complete the Site Plan with the appropriate words (A-H).



1C. Vocabulary. Provide a translation for the following terms:

A. land plot _____; **B.** approach road _____;

C .built-up area _____; **D**. open spaces_____;

E. water line _____; **F**. sewage line_____;

G. electricity line _____;

2. Pre-reading exercise. Provide a translation for the following terms:

office _____; accommodation _____;

storage area _____; fences _____;

layout_____; hard hat _____;

remote_____; first aid kit _____;

fire extinguisher _____; escape route _____;

messroom _____; contractor _____;

laydown areas _____; warehouses_____;

debris _____; batch plant_____;

silo _____; aggregate storage piles _____;

carpentry_____;

3. **Reading.** Read the text and answer the questions

The Construction Site- Layout and Planning

Many considerations need to be accounted for while setting the layout of the construction site, for example, considerations for site access, **offices** and **accommodations**, **storage area**, temporary services, **fencing**, health and safety. The objective of the site **layout** is to provide a safe and economical flow of materials and workers.

Any construction site should meet the minimum requirements of the applicable health and safety regulations. Workers need to use personal protective equipment such as **hard hats**, **safety shoes**, **goggles**, or **gloves**. The construction site should also have access to medical services and should be stocked with **first aid kits**. Moreover, for **remote** projects, a well-equipped medical room with a doctor and nurse is important. Lastly, all construction sites should have **fire extinguishers** as fire is a major cause of damage on construction sites.

When organizing a construction site, accessibility is also an important factor. It is necessary to examine roads on and off the construction site. The suitability of the roads to transport all requirements for the suggested construction site and also for general circulation should be examined. Ease of accessibility would minimize the chances of accidents, increase the morale of drivers, and cut the time needed to leave and arrive at the project site. Furthermore, every construction site must have a **site map** (containing the details of the project), **traffic regulatory signs** (for large projects) and **emergency escape routes** (to avoid accidents on the site).

On large construction projects, it is necessary to provide camp accommodation for all types of staff involved in the project. These are often complemented by **messrooms**, **toilet facilities** and **craft change-houses**. These offer the minimum comfort needed for the workforce. Offices are also found on the construction site and may include job offices, general **contracto**r offices, and sub-contractors and consultants' offices.

It is also necessary to plan and reserve storage areas for materials so that multiple movements of material are avoided. On construction sites, you can find **laydown areas** that are reserved for the storage of large materials and equipment and **warehouse**s used to shelter construction materials. During construction work, a lot of **debris** is produced. That is why the regular disposal of debris is necessary. Lastly, every construction site needs to be secured. Most construction sites are fenced and protected by guards.

Batch plants are also provided on projects where it is more economical to produce concrete on site than to buy a ready mix. **Aggregate storage piles** and **cement silos** will accompany on-site batch plants. Shops are used where materials and equipment are fabricated on site. This includes electrical, mechanical, **carpentry** and paint shops.

(Taken and adapted from https://tinyurl.com/yc4u7sx4)

3A. Based on the reading from Exercise 3A, answer the following questions:

A. What are the main safety considerations that should be accounted for when designing the layout of a construction site?

_____

_____

_____
_____

B. How can a construction site be secured?

_____
_____
_____
_____
_____

C. Why are storage facilities important on a construction site?

_____
_____
_____
_____
_____

D. What are some main construction site buildings intended for the workforce and the staff?

_____
_____
_____
_____
_____

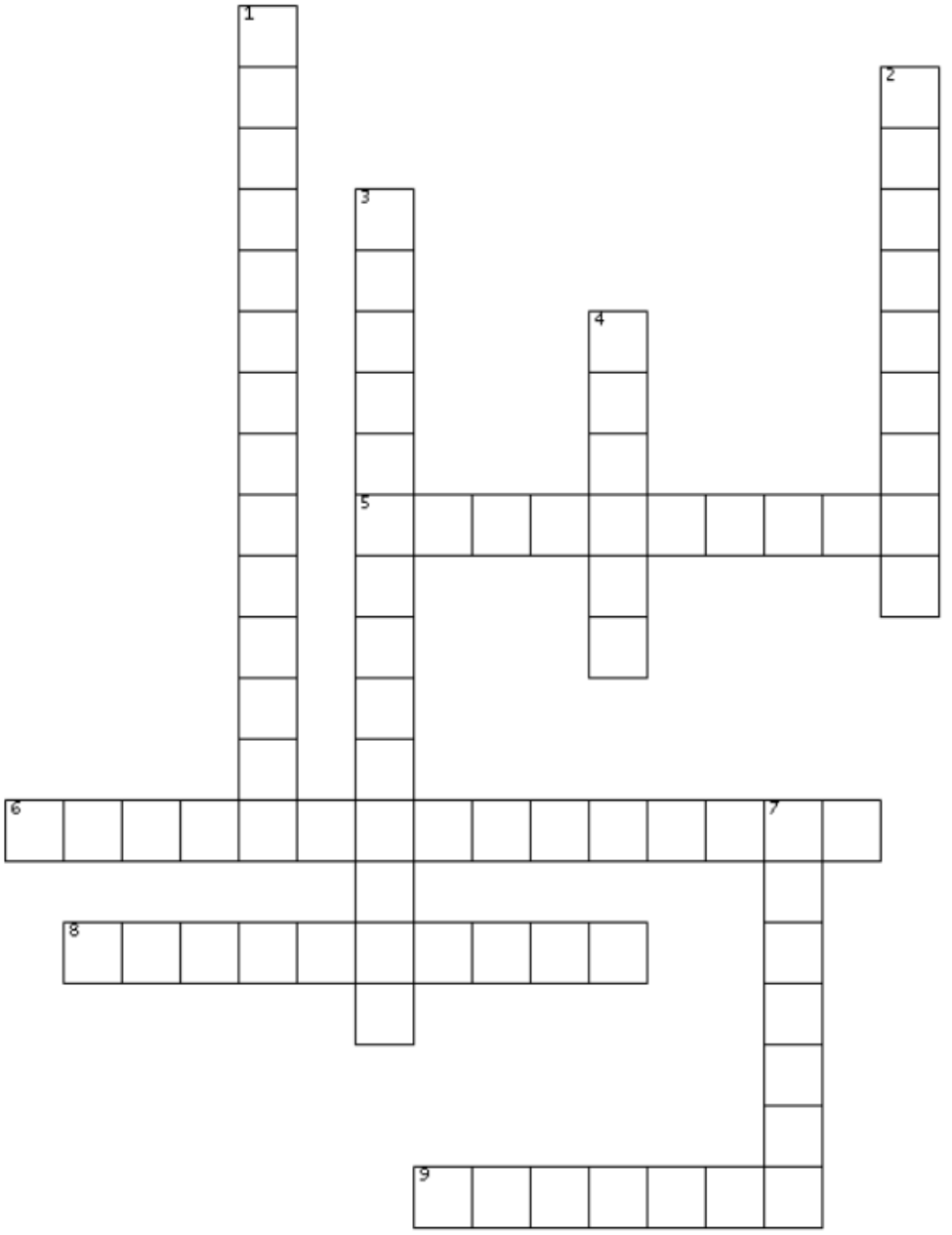
E. Why is accessibility important on a construction site?

_____
_____
_____
_____
_____
_____

F. Why are batch plants and stores used on large construction sites?

_____
_____
_____
_____

4. Construction site layout. Complete the crossword puzzle.



ACROSS

5. Main utilities needed on a construction site (2 words).

6. The load-bearing portion of the structure, typically built below ground (2 words).

8. The main road that provides access to the construction site (2 words).

9. Sanitation units that are needed for the workforce involved in the construction process.

DOWN

1. Also known as a depot. An enclosed space used to store stone (2 words).

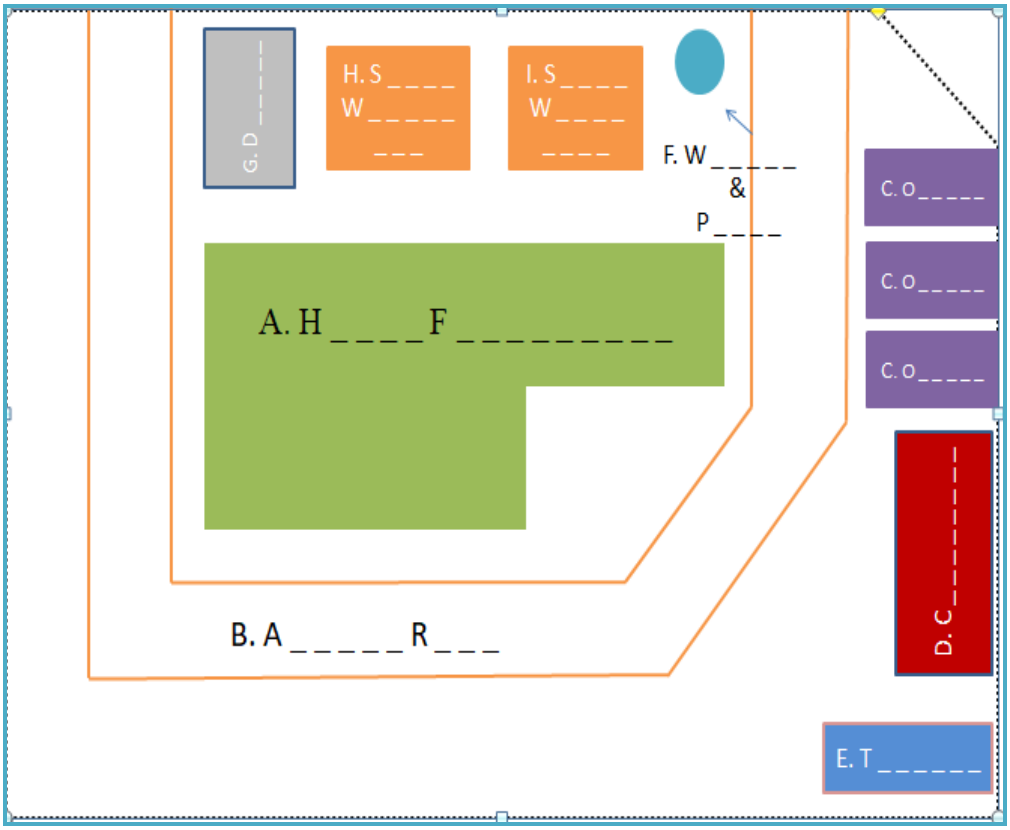
2. An enclosed space dealing with cutting, shaping and installing wooden structures.

3. Also known as a depot. An enclosed space used to store metallic structures (2 words).

4. A place to store rubbish or remains after cleaning the construction site.

7. Spaces that provide accommodation for site managers, provide space for meetings and provide storage for site documentation.

5. Complete the missing words from the construction site plan. These can be found in Exercise 4.



A. H _ _ _ _ F _ _ _ _ _ _ _ _ _; **B.** A _ _ _ _ _ R _ _ _;

C. O _ _ _ _ _ _;**D**. C _ _ _ _ _ _ _ _ ; **E.** T _ _ _ _ _ _;

F. W _ _ _ _ & P _ _ _ _; **G.** D _ _ _ _ _;

H. S _ _ _ _ W _ _ _ _ _ _ _ _; **I.** S _ _ _ _ W _ _ _ _ _ _ _ _;

6. Use the words from the table and put them in the right context.

primary, organisational, tasks, critical, challenging, resources, schedule, flawless, planning, finely-tuned.

Construction planning is a fundamental and 1. _____ activity in the management and execution of construction projects. It involves the choice of technology, the definition of work tasks, the estimation of the required 2. _____ and durations for individual tasks, and the identification of any interactions among the different work 3. _____. A good construction plan is the basis for developing the budget and the 4. _____ for work. Developing the construction plan is a 5. _____ task in the management of construction, even if the plan is not written or otherwise formally recorded. In addition to these technical aspects of construction 6. _____, it may also be necessary to make organizational decisions about the relationships between project participants and even which organizations to include in a project.

(Taken from*:* https://tinyurl.com/jbt3npt9)

Effective organisation lies at the heart of every successful construction project. To such an extent that the project's costs, duration and viability can be strongly influenced by key 7. _____, issues. For obvious reasons, the construction site itself must be organised to the level of a 8. _____, machine, in order to facilitate 9. _____, performance.

When one or more elements of the site fail to perform, the entire project suffers. Or perhaps, comes to a grinding halt. As such, site organisation is one of the 10. _____, responsibilities of the professional construction manager.

(Taken from**:** https://tinyurl.com/2p98j723)

7. Translation. Translate the sentences from English to Romanian.

A. *A construction site can be defined as an area or a piece of land on which construction works are being carried out. There are different types of construction sites. These can be further classified on account of the types of buildings being erected, their usage, and purpose. Among these categories, we can mention* ***housing or residential units***, ***waste management plants***, ***infrastructure for traffic and transport,*** *buildings intended for power generation, and* ***gas and oil plants.***

_____
_____
_____
_____
_____
_____
_____
_____

B. *Housing and residential buildings have their own set of legislation in most countries. Construction sites for housing include* ***houses, apartments*** *and* ***small condos.*** *The facilities such as* ***pool***, ***theatre***, *and parks inside the condo are also part of the construction site. The construction site of* ***gas and oil pipelines*** *has a strong security in their surroundings. Generally, there is a considerable distance between where the* ***fieldworks*** *take place and the entrance of the construction site.*

_____
_____
_____
_____
_____
_____
_____
_____
_____

C. *The most common methods to generate electricity are* ***coal***, ***gas,*** *and* ***oil***. *Nonetheless,* ***hydroelectric*** *and* ***solar plants*** *alongside* ***windmills*** *are on-demand from developing and developed countries alike. Although the infrastructure to generate power using solar plants differs from* ***gas pipelines***, *both of their construction sites include structures to store and transmit the energy generated.*

_____

_____

_____

_____

_____

_____

_____

D. ***Waste management plants*** *are commonly found at the edge of cities. They are connected through* ***sewerage systems*** *to commercial and housing infrastructure.* ***Airports***, ***freeways***, ***bridges***, ***ports***, *and* ***railways*** *are part of the traffic and transport infrastructure. They are some of the most important infrastructure projects countries engage with, moving billions of euros a year and often representing a significant portion of the GDP.*

_____

_____

_____

_____

_____

_____

(Taken and adapted from Geoff, Craighead. 2009. "Residential and Apartment Buildings". In In *High-Rise Security and Fire Life Safety* available at https://tinyurl.com/3k4th6tp; https://tinyurl.com/mt5ysujz)

Unit 7: Additional exercises

8. Classroom activity. Go to pages 140-142 and choose an interactive classroom activity.

Key words: Glossary of Terms (UNIT 7)

English	Romanian
accommodation	spații de locuit/ cazare
aggregate storage piles	stive de agregate
approach road	drum (principal) de acces
batch plant	stație de beton
built-up area	suprafața construită
carpentry	tâmplărie
coal	cărbune
contractor	contractant
debris	resturi/rămășițe
electricity line	linia electrică
fence	gard
fieldwork	muncă de teren
fire exstinguisher	extinctor
first aid kit	trusă de prim ajutor
gas and oil plants	uzine de extracție a gazului și a petrolului
goggles	ochelari de protecție
hard hat	cască de protecție
land plot	parcelă de teren
laydown areas	zone de stocare/depozitare (pentru materiale și utilaje)
messroom	sală de mese/cantină
open spaces	spații deschise
pipelines	conducte
pool	piscină
railways	căi ferate
remote	izolat
residential units	unități rezidențiale (locuințe)
safety shoes	încălțăminte de protecție
sewage line	linia de canalizare
sewerage systems	sisteme de canalizare
silo	siloz
storage area	zonă de depozitare
traffic and transport infrastructure	infrastructura rutieră și de transport
warehouse	depozit

waste management plants	stații de reciclare și gestionare a deșeurilor
water line	linia de alimentare cu apă
windmills	mori de vânt

UNIT 8: MACHINES AND TOOLS USED IN CIVIL ENGINEERING

1. Vocabulary - Machines in Civil Engineering. Look at the pictures. Write down the names of the machines. If you do not know the English terms, write down their Romanian equivalents.

A._____;

B._____;

C._____;

D._____;

E._____;

F._____;

G._____;

H._____;

I._____;

J._____;

2A. Vocabulary - Comprehension. Every machine utilised in the field of Civil Engineering serves specific purposes. Match the machine (1-7) with its practical use (A-G).

A. Mainly used for earthmoving (to pull a **load** or attachment or push a load with a front-mounted **blade**).	**1.** Scissor lift
B. Used to plane or grade the surface of the ground to the desired shape and elevation (to level the soil before commencing construction works).	**2**. Drum compactor

D. Used to transport construction materials around project sites and to load and unload trucks and **rail cars**.	**4.** Grader
E. A type of construction machine used to apply pressure to the soil that reduces **air pocks** and allows the soil to handle heavier weights on even surfaces.	**5.** Cement mixer
F. A machine with a **revolving drum** used for mixing cement with sand, gravel, and water to make **concrete.**	**6.** Forklift
G. A mechanical lifting platform that is used to provide temporary access for people and equipment to elevated and inaccessible areas.	**7.** Bulldozer/dozer

(Taken from: https://tinyurl.com/2p3m37p4)

2B. 🎧 **Vocabulary - Pronunciation.** Listen and pronounce the words from Exercise 2A.

URL: https://tinyurl.com/2p95ej8n

2C. Provide a translation for the following terms:

load _____; blade _____; sand _____;
gravel_____; rail cars_____; air pocks_____;
revolving drum _____;

3. Writing. Answer the following questions:

1. One of the most practical machines to move goods inside a warehouse:

_____

2. A machine used to grant you access to elevated or inaccessible areas:

_____

3. What machine can you use if you need a mobile crane?

_____

4. If you want to move tons of gravel for long distances, what is the best vehicle to use?

_____

5. What machine would you use if you want to level earthen roads?

_____

6. What machine should you use if you want to increase the density of the soil after you have leveled it?

_____

7. What machine should you use if you want to load up a truck with debris?

_____

8. What machine should you use if you want to pull a heavy load on a construction site?

_____

4. Writing. What other machines used in Civil Engineering do you know? What are their main uses? Provide 3 to 5 examples.

_____

_____

_____

_____

_____

_____

_____

5. Vocabulary - Construction Tools. Look at the pictures and write down the names of the construction tools.

A._____;

B._____;

C._____;

D._____;

E. _____;

F. _____;

6. Translation. Translate the sentences (from English to Romanian).

A. *An **angle grinder** (or disc grinder) is a hand-held **power tool** with a small abrasive rotating disc used to **cut** or **grind** masonry, concrete, or steel.*

_____

_____

_____

B. *A **pick hammer** (or jackhammer) is a hand-driven apparatus that works on compressed air, hydraulically, or electrical power. This tool is mostly used **to carry out** demolition works.*

_____

_____

_____

C. *A **pickaxe** is a hand tool fitted with a short **handle** particularly used as a manual **digging** tool.*

_____

_____

D. *The term "**trowel**" refers to any of various **hand tools** used to apply, **spread**, **shape**, or **smooth** different types of materials i.e. concrete.*

_____

_____

_____

E. *A **rotary hammer**, also called a rotary hammer drill is a power tool that can perform **heavy-duty tasks** such as **drilling** and **chiseling** hard materials.*

_____

_____

_____

(Definitions taken and adapted from: Gorse, Christopher; David, Johnston; Pritchard, Marton. 2012. "Dictionary of Construction, Surveying and Civil Engineering. Oxford: Oxford University Press and https://tinyurl.com/2p3m37p4)

Unit 8: Additional exercises

7. Building Tools. Carefully read and translate the e-mail (from Romanian to English)

To buildingconstruct@gmail.com

Cc dan.nistor@buildct.com

Subject: Revizie tehnică unelte și mașini

Bună ziua,

Vă rugăm să verificați starea tehnică a utilajelor și instrumentelor din următoarea listă:

- 10 polizoare unghiulare;
- 5 picamere;
- 3 basculante;
- o nacelă foarfecă;
- 2 stivuitoare;
- 4 buldozere;
- omologarea macaralei mobile;

Aceste verificări trebuie finalizate pâna la data de 23.04.2023, utilajele și uneltele urmând să fie folosite pentru finalizarea unui tronson de drum.

Cu stimă,

Ing. Ionescu Ciprian

Key words: Glossary of Terms (UNIT 8)

English	Romanian
air pockets	goluri de aer
angle grinder/disc grinder	polizor unghiular/flex
backhoe/rear actor/ back actor	buldoexcavator
blade	lamă
boom truck/ truck-mounted crane	camion cu macara
bulldozer/dozer	buldozer
concrete mixer	betonieră
drum compactor/road roller	cilindru compactor
dump truck/ dumping truck/dump trailer/ dumper trailer/ dump lorry/dumper lorry/dumper	basculantă
forklift/ lift truck/ fork truck/ forklift truck/ fork hoist	stivuitor/motostivuitor
grader/road grader/motor grader/blade	greder/autogreder
gravel	pietriș
load	sarcină/încărcătură
loader	încărcător/ încărcător frontal
certification	omologare
pick hammer/ jackhammer	ciocan pneumatic
pickaxe	târnăcop
rail cars	vagoane
revolving drum	cilindrii rotativi/ cilindrii autobetoniere
rotary hammer/ rotary hammer drill	ciocan rotopercutor
sand	nisip
scissor lift	nacelă foarfecă
tower crane	macara turn
trowel	mistrie
utility knife	cuter/cutter

UNIT 9: PERSONAL PROTECTIVE EQUIPMENT

1. **Classroom Discussion.** What type of protective equipment should civil engineers wear on a construction site? Write your answer here.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

2. **Vocabulary.** Fill in the blanks with the correct word from the following box:

clothing; composite; hard; glasses; vest; plugs; knee; dorsal; safety; apron;

A. ……. harness
B. ……. pads
C. protection ……....
D. ear ……...
E. …….. toe shoes
F. …… hat
G. safety ……
H. safety ……
I. …….belt
J. …….belt

3. 🎧 **Vocabulary–Pronunciation.** Listen and pronounce the words discussed in Exercise 2.

URL: https://tinyurl.com/34kjukt6

4. **Vocabulary - Personal Protective Equipment.** Look at the pictures and write down the type of safety equipment that they represent.

A._____; **B.**_____;

C._____; **D.**_____;

E._____; **F.**_____;

G._____; **H.**_____;

I._____; **J.**_____;

K._____; **L.**_____;

5. Reading. Read the following text and decide if the statements below are TRUE or FALSE.

The construction industry reports the highest number of fatal injury accidents every year. Even after thorough risk assessments and the implementation of adequate controls into a work environment, workers could still be subject to health and safety risks from hazards, which is why PPE is so important.

Personal Protective Equipment (PPE) includes all equipment (even those used to protect against adverse weather conditions) used to protect employees from health and safety risks they might encounter at work, including injuries to the lungs, head, eyes, ears and skin.

Where required, wearing task-appropriate, well-fitted PPE can be the difference between life and death in the event of an accident.

When selecting PPE, it is important to ensure that:

- The equipment is tailored; the correct size, fit and weight of the PPE must be chosen for every user, so it is safe and easy for them to make use of.
- If multiple items of PPE must be worn simultaneously, all the equipment can be utilized effectively together. For example, do not use safety glasses that disturb the seal of a respirator.
- Workers are properly trained and instructed on how to use their PPE. Ensure they are aware of the PPE's limitations, why it is needed and when they should use it.

(Taken from: https://tinyurl.com/3rm88amx)

A. The restaurant industry reports the highest number of fatal injury accidents every year.

B. PPE is the acronym for personal pilot equipment.

C. PPE should be tailored for each worker.

D. You can use safety goggles that disturb the seal of a respirator

E. Workers should be properly trained on how to use their PPE.

F. PPE is not used to protect your ears.

G. Wearing task-appropriate, well-fitted PPE can be the difference between life and death in the event of an accident

H. When selecting PPE, it is important to ensure that if multiple items of PPE must be worn simultaneously, all the equipment can be utilized effectively together.

I. Workers are not in danger of injuring their skin.

J. PPE can protect a worker against adverse weather conditions.

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.

6. Writing. Translate the following paragraphs (from English to Romanian and from Romanian to English)

A. *The bones in the foot are easily damaged, with an injury to muscle or tendons potentially prohibiting normal foot movement for several months. Therefore, it is highly important to take precautions that minimize the risk of a foot injury. The ideal foot PPE encompasses steel toecaps, to protect from dropped objects, and steel midsole protection, to protect against puncture or penetration wounds from stepping on sharp objects.* (Taken from: https://tinyurl.com/3rm88amx)

_____
_____
_____
_____
_____
_____
_____

B. *When working on a construction site, there might be occasions when workers are required to work with contaminated dust (such as asbestos) or may be at risk from chemical or metal splashes, spray from pressure leaks or spray guns, entanglement of their own clothing, impact, or penetration. In these situations, the use of conventional or disposable overalls, boiler suits, aprons, or chemical suits made from various materials, might be required to protect from workplace hazards.*(Taken from: https://tinyurl.com/3rm88amx)

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_____

C. *Echipamentele de protecție au fost utilizate încă din cele mai vechi timpuri, în domenii non-militare precum fierăria. Maeștrii fierari purtau șorțuri și mănuși de protecție, în lucrul cu metale supuse unor temperaturi foarte ridicate. Elementele destinate protejarii capului (pălării dure, utilizate în domenii precum mineritul și construcțiile) erau destul de rudimentare, însă au contribuit la formarea unei percepții colective, privind importanța măsurilor de siguranță la locul de muncă.* (Taken from: https://tinyurl.com/yns9uhbn)

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_____
_____

D. *Căștile specializate pot fi întâlnite nu doar în construcții. De zece ani, acestea sunt și un element indispensabil al electricienilor și electromecanicilor. Cel mai adesea întâlnim în acest caz cel puțin unul dintre standardele EN 397 sau EN 50365. Primul se referă la căștile care asigură amortizarea pe verticală a șocurilor, rezistență la penetrare și la flamă. Aceste căști trebuie să fie prevăzute, de asemenea, cu o curea pentru fixarea bărbiei.* (Taken from: https://tinyurl.com/99rra937/)

_____
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_____

7. Reading. Read the following texts and answer the questions below.

Head protection is required on almost all construction sites. Construction work needs to be organized to minimize all risks to workers, however, hazzards will likely remain, and everyone will be required to always wear safety helmets while on site. To comply with the Personal Protective Equipment Regulations 1992, employers must provide all employees with, and ensure they wear, suitable head protection. Employees should be provided with a safety helmet or hard hat for use at work; bump caps only protect from non-moving hazards and are not adequate protection for construction workers. The only exception to the 'hard hat rule' is for Sikhs who wear turbans. They are exempt from the legal responsibility of wearing a hard hat on a construction site, however, it is important to stress the risks they are taking by not wearing head protection.

Ear protection is needed to protect workers from noise hazards. Both the exposure duration and the sound level workers are submitted to can contribute to ear damage. Even if workers are only subjected for a short duration, very high-level sounds can still pose a hazard to the ears. Therefore, all workers must be provided with the correct type of hearing protection for the type of work they are undertaking. The options available for ear protection are earplugs, earmuffs, and semi-insert/canal caps. Ear PPE must provide a suitable level of protection for the work being undertaken and must not compromise safety or communication. All workers must also be clear on how to wear their PPE correctly, to ensure maximum protection.

Lung protection is commonly required when working on a construction site as workers often encounter hazards such as dust, gases, and vapors. When selecting lung PPE, it is important to ensure that the chosen piece of equipment fits the intended user properly. If incorrectly fitting respiratory PPE is selected, an adequate seal might not be formed, leaving workers susceptible to workplace hazards. It is important to ensure that the right type of respirator filter is used for the specified hazard, as each filter is only suitable for a small range of substances. (Source: https://tinyurl.com/3rm88amx)

A. What are the types of PPE that the texts above are discusses?

B. Who are the only workers exempted from using hard hats?

C. Why is it necessary to use ear protection while working on a construction site?

D. What are the available types of ear protection?

E. What are the hazards that construction site workers can encounter for their lungs?

F. Why is it important to use correctly fitting respiratory PPE?

Unit 9: Additional exercises

8. Writing. You are working on a construction site and a group of 10 new people has joined your team. You notice that some of them are not wearing well-fitted PPE, while most are not wearing PPE at all. After you discuss it with them, you understand that the company did not provide them with such equipment. Write an email to your manager in 100-150 words. Tell your manager: how you feel, what you want, and why. Be sure to use polite language and give your manager enough information.

Key words: Glossary of Terms (UNIT 9)

English	Romanian
personal protective equipment (PPE)	echipament individual de protecție (EIP)
hard hat	cască de protecție
composite toe shoes	ghete cu bombeu metalic
ear plugs	dopuri de urechi
dorsal belt	centură dorsală
safety harness	ham de siguranță
safety apron	șorț de protecție
safety vest	vestă de protecție
protection glasses	ochelari de protecție
hazmat suit	costum de protecție
overalls	salopetă
welding helmet	cască de sudură
respiratory filter	filtru de respirație
hazard	pericol
protection mask	mască de protecție
well-fitted	potrivit, bine ajustat
bump cap	șapcă de protecție
toecaps	bombeu, vârf bombat (de pantof)

UNIT 10: ROADS AND RAILWAY LINES

1. Vocabulary. Match the words from the box with the correct definition:

driveway, cul-de-sac, lane, pavement, tarmac, pedestrian crossing, buffer stop, monorail, locomotive, ballast

A. The rocky surface beneath **railroad racks.**

B. The part of a road for people to walk on.

C. Material used for surfacing roads or other outdoor areas, consisting of broken stone mixed with **tar**.

D. An engine on rails using diesel, steam, or electricity to pull trains.

E. A place designated for pedestrians to cross a road, street, or avenue.

F. The barrier that is installed at the end of **a dead-end track** to prevent rail vehicles from proceeding further.

G. A division of a road marked off with painted lines and intended to separate single lines of traffic according to speed or direction.

H. A short private road for access to a house or a garage.

I. A street that has only one **inlet**.

J. A railway in which the track consists of a single rail or a **beam**.

1B. 🎧 **Vocabulary - Pronunciation.** Listen and pronounce the words from Exercise 2A.

URL: https://tinyurl.com/6jjabaft

2. Reading. Read the following text and answer the questions:

When urban street paving became widespread in the latter half of the 19th century, the common paving materials were hoof-sized stone blocks, similarly sized wooden blocks, bricks, McAdam's broken stone, and occasionally asphalt and concrete. McAdam's broken stone provided the cheapest pavement, but its unbound surface was difficult to maintain and was usually either slimy or dusty as a consequence of water, weather, and copious amounts of horse excrement. Thus, roads at the turn of the 20th century were largely inadequate for the demands about to be placed on them by the automobile and truck. As vehicle speeds increased rapidly, the available friction between road and tire became critical for accelerating, braking, and cornering. In addition, numerous pavement failures made it obvious that much stronger and tougher materials were required. The result was an ongoing search for a better pavement. Asphalt and concrete both offered promise.

Asphalt is a mixture of bitumen and stone, and concrete is a mixture of cement and stone. Asphalt footpaths were first laid in Paris in 1810, but the method was not perfected until after 1835. The first road use of asphalt occurred in 1824 when asphalt blocks were placed on the Champs-Élysées in Paris, but the first successful major application was made in 1858 on the nearby rue Saint-Honoré. The first successful concrete pavement was built in Inverness, Scotland, in 1865. Neither technology, however, advanced far without the pressures of the car, and they both required the availability of powerful stone-crushing, mixing, and spreading equipment.

(Source: https://tinyurl.com/bde9fy84)

A. What were the most common paving materials in the latter half of the 19th century?

_____

_____

_____

_____

_____

B. What were the downsides of McAdam's broken stone?

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_____
_____
_____
_____

C. Why was there a need for better pavement at the beginning of the 20th century?

_____
_____
_____
_____
_____

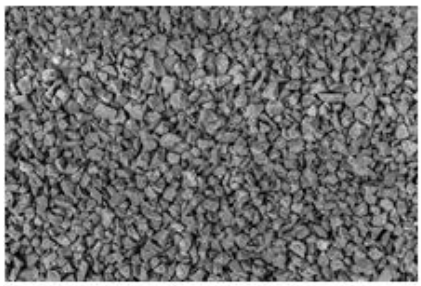
D. What are asphalt and concrete?

_____
_____
_____
_____
_____

E. What was the first road to ever use asphalt?

_____
_____
_____
_____

3. Vocabulary. Write the correct word under each image:



A._____;

B._____;

C._____;

D._____;

E._____;

F._____;

G._____;

H._____;

I._____;

J._____;

4. Reading. Read the following text and decide if the statements are TRUE or FALSE.

When a track is laid on a completed roadbed, its foundation is ballast, usually of crushed rock, slag, or volcanic ash. The sleepers, or crossties, to which the rails are fastened, are embedded in the ballast. This is tightly compacted or tamped around the sleepers to keep the track precisely leveled and aligned. Efficient drainage of the ballast is critically important to prevent its destabilization. The depth of ballast depends on the characteristics of a line's traffic; it must be considerably greater on a track carrying frequent high-speed passenger trains, for example, than on one used by medium-speed commuter trains.

In some situations where track maintenance is difficult, such as in some tunnels, or where drainage problems are acute, ballast and sleepers are replaced by continuous reinforced concrete support of the rails. This system, known as slab track, maintains accurate track geometry without maintenance attention for much longer periods than ballasted track, but its reduced maintenance costs are offset by higher first and renewal costs.

In western Europe, considerable stretches of new high-speed railroad have been and are being built alongside multilane intercity highways. This simplifies the location of the new railroad and minimizes its intrusion into the rural landscape. Such sharing of alignment is feasible because tracks for the dedicated use of modern high-speed train sets can be built with curves and gradients not far short of the most severe parameters tolerated in contemporary express highway construction.

(Source: https://tinyurl.com/y7bzbr6c)

A. Ballast is made from crushed concrete.

B. **Ballast** must be considerably greater on a track carrying frequent high-speed passenger trains.

C. **Slab track** is a system that requires a lot of maintenance attention.

D. In western Europe considerable stretches of new high-speed railroad are being built alongside **multilane** intercity highways.

E. Building railroads alongside highways is highly **intrusive** in the rural landscape.

F. **Sleepers** are also known as **cross fits**.

G. The depth of ballast does not depend on traffic.

H. In tunnels, the **maintenance** of the tracks can be difficult.

I. Sleepers are **embedded** in the ballast.

J. Efficient drainage of the ballast is critically important to prevent its destabilization.

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.

5. Translation. Translate the following paragraphs from English to Romanian and from Romanian to English:

A. *Since the beginning of the 20th century, as the automobile and truck have offered ever-higher levels of mobility, vehicle ownership per head of population has increased. Road needs have been strongly influenced by this popularity and also by the mass movement of people to cities and then to suburban fringes—a trend that has led to increasing travel needs and road congestion and to low-density cities, which are difficult to service by public transport.*

_____

_____

_____

_____

_____

_____

_____

_____

B. *In the first half of the 20th century, advances in railroad technology and operating practices were limited. One of the most far-reaching was the perfection of diesel traction as a more efficient alternative to steam and as a more cost-effective option than electrification where train movements were not*

intensive. Another was the move from mechanical signaling and telephonic traffic-control methods to electrical systems that enabled centralized control of considerable traffic areas.

_____
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_____
_____
_____
_____

***C**. Chiar și în timp ce automobilul și avionul au devenit proeminente, căile ferate au dezvoltat tehnologiile necesare pentru a concura cu acestea pe piața vitală a transportului interurban. În prezent, producătorii de trenuri și operatorii feroviari au capacitatea de a furniza echipamente și servicii care să transporte pasageri pe distanțe lungi la viteze medii de 200 km pe oră sau mai mult. În aprilie 2007, un tren special TGV (Train à Grande Vitesse), trenul de mare viteză exploatat de Căile Ferate Franceze, a stabilit un record de viteză de 574,88 km pe oră pe o linie de testare din nordul Franței.*

_____
_____
_____
_____
_____
_____
_____
_____

***D**. În limbajul modern, termenul "drum" descrie un drum rural, mai puțin circulat, în timp ce cuvântul "stradă" desemnează un drum urban. Autostradă se referă la o cale de circulație rurală majoră; mai recent, a fost folosit pentru un drum, fie într-o zonă rurală, fie într-o zonă urbană, unde punctele de intrare și ieșire pentru trafic sunt limitate și controlate. Cea mai veche denumire pentru aceste artere de circulație pare a fi antecedentul drumului modern.*

_____
_____
_____
_____

_____

_____

_____

_____

(Source: https://tinyurl.com/bde9fy84)

6. Vocabulary - Famous roads and train stations. Match the names with the images.

Abbey Road, Grand Central Station, King's Cross Station, Ho Chi Minh trail, Gare du Nord, Transfăgărășan Road, Route 66, Shibuya Crossing

A._____;

B._____;

B._____;

C._____;

D._____;

E._____;

F._____;

G._____;

Unit 10: Additional exercises

7. Classroom Activity. Go to pages 140-142 and choose an interactive classroom activity.

Key words: Glossary of Terms (UNIT 10)

English	Romanian
ballast	balast
buffer stop	oprire tampon/ tampon stop
cross fits	încrucișate
cul-de-sac	alee/ fundătură
driveway	alee
dusty	prafuit(ă)
embedded	încorporat
highway	autostradă
intrusive	intruziv
lane	bandă
locomotive	locomotivă
macadam	macadam
maintenance	întreținere
manhole	gură de canal
moonrail	monoșină
multilane	mai multe benzi
one way street	stradă cu sens unic
pavement	pavaj/trotuar
pedestrian crossing	trecere de pietoni
slab track	vagon de dormit
sleeper	traversă
slimy	vâscos
steam locomotive	locomotivă cu abur
tarmac	tip de asfalt
traffic light	semafor
train station	gară

UNIT 11: BRIDGES AND WATERWAYS

1. Vocabulary: Fill in the gaps with the correct word from the box:

foot, process, main, suspension, water, bridge, span, course

A. .....bridge
B. waste.....
C. ..... bridge
D. chemical ..... plant
E. ain .....
F. ater .....

2. 🎧 Vocabulary - Pronunciation. Listen and pronounce the words from Exercise 1.

aqueduct; bascule bridge; camber; culvert; dam; sewer; pier; irrigation; cable-stayed bridge, drainage;

URL: https://tinyurl.com/yaa4wxze

3. **Vocabulary – Types of bridges.** Write the correct word under each image:

A._____;

B._____;

C._____; **D.**_____;

E._____; **F.**_____;

G._____; **H.**_____;

I._____; **J.**_____;

4. Reading - Types of Bridges. Read the following text and decide whether the statements are TRUE or FALSE:

The **beam bridge** is the oldest, simplest, and most common type of bridge. A beam bridge is a horizontal, or level, structure. It has a **support** on each end. Other supports, called **piers**, may also hold up the bridge between the two ends. A **log** or a plank that crosses a stream is a beam bridge in its most basic form. Modern beam bridges are usually made of steel beams, called **girders**. Most highway bridges are beam bridges.

Like the beam bridge, the **truss bridge** has a support at each end. It may also rest on piers in between. But its structure gives it more strength than a simple beam bridge. A **framework** of metal or wood bars connects the two ends of the bridge.

The **cantilever bridge** is made up of structures called **cantilevers**. A cantilever is a beam that has a pier at only one end, like a diving board. A framework of many bars adds strength to the beam, as in a truss bridge.

Like the beam bridge, the **arch bridge** is a very old design. An arched structure built beneath the bridge's roadway provides its support. Arch bridges often **span** rivers and valleys.

In the **suspension** type of **bridge**, the **roadway** hangs from strong wires called cables. The main cables hang between two or more towers. Smaller cables hang down from the curving main cables. The smaller cables hold up the roadway. Suspension bridges can span longer distances than any other type of modern bridge.

A **cable-stayed bridge** also uses cables to support the roadway. Its cables run directly between the **towers** and the roadway. They attach to the roadway in straight, diagonal lines.

Some types of bridges are movable. Some may open **upward** to allow tall ships to pass **underneath**. Others may turn **sideways**. Still, others, called **pontoons**, float on water.

(Source https://tinyurl.com/28munhxy)

A. Modern beam bridges are usually made of steel beams, called girders.

B. Pontoons do not float on water.

C. A cantilever is a beam that has a pier at both ends.

D. The cantilever bridge is made up of structures called cantilevers.

E. A log or a plank that crosses a stream is a beam bridge in its most basic form.

F. Arch bridges often span mountains.

G. In the suspension type of bridge, the roadway hangs from strong wires called cables.

H. The beam bridge is the newest type of bridge.

I. Suspension bridges are the shortest bridges.

J. Some types of bridges are movable.

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.

5. Writing. Using online resources, search for some of the most famous bridges ever made. Choose one and provide a short description of the bridge (50-100 words). You should mention the (1) type of bridge, (2) its measurements (height, weight, length, width, main span), (3) its location and some (4) unique features.

6. Reading - Waterways. Read the text and answer the questions:

Waterways include natural rivers and artificial waterways that may be rivers modified to guarantee navigation. Rivers are the surface expression within each **drainage basin** of the way in which water from precipitation progresses through the hydrological cycle to seas or lakes. Few rivers are completely natural and unmodified: they have been changed by a range of direct and indirect influences. They are dynamic components of the environment because both the water quantity and the quality of the water and also the channel itself can change. Five aspects that are pertinent in relation to the conservation of waterways are (a) the need to control the quantity of water—managed river channels are modified to a design **discharge**; (b) the need to control the quality of water—in relation to pollution; (c) the need to manage river channels—many are now being restored to appear as 'natural' as possible; (d) the need to identify and conserve areas with special features as exemplars of typical waterways and to educate the public about natural **riverscapes**; and (e) the need to manage waterways in a **holistic** way in **Integrated Basin Management** (IBM).

(Source: Fearnside, Philip M. 2013. "South American Natural Ecosystems, in Encyclopedia of Biodiversity, 2nd edition, online, available at https://tinyurl.com/2p89n9nx)

A. What are waterways?

_____

B. Are there many unmodified rivers?

_____

C. What are changes that can occur in rivers?

_____

D. In relation to pollution what should be done to waterway conservation?

_____

Unit 11: Additional exercises

7. Fun with bridges. Can you name the country of origin for these famous bridges?

A._____;

B._____;

C._____;

D._____;

E._____;

F._____;

8. Classroom Activity. Go to pages 140-142 and choose an interactive classroom activity.

Key words: Glossary of Terms (UNIT 11)

English	Romanian
(bridge) piers	piloni de pod
(bridge) supports	sisteme de suport (pentru poduri)
(bridge) towers	turnuri de pod
aqueduct	apeduct
arch bridge	poduri pe arce; poduri în arc; poduri pe bolți
bascule bridge	pod- basculă
beam bridge	poduri pe grinzi
cable-stayed bridge	pod hobanat
camber	unghi de cădere (al roților); unghi de carosaj
cantilever bridge	pod în consolă
cantilevers	console
chemical process plant	uzină de procesare chimică
culvert	canal de scurgere
dam	baraj
discharge	evacuare; descărcare
drainage	scurgere
drainage basin	bazin de scurgere
footbridge	podeț
framework	cadru
girders	grinzi
holistic	cuprinzător
hydrant	hidrant
Integrated Basin Management	gestionarea integrată a bazinelor hidrografice
irrigation	irigații
log	buștean
main span	deschiderea unui pod
pier	dig
pontoon	ponton
riverscapes	peisaje fluviale
roadway	șosea
sewer	canalizare
sideways	pe lateral
suspension bridge	pod suspendat
to span	a se întinde

English	Romanian
truss bridge	podul de fermă
underneath	dedesupt
upward	ascendent; în sus
wastewater	apă uzată; apă reziduală
water course	curs de apă
water main	conductă (principală) de apă
waterways	căi navigabile

UNIT 12: CONCRETE WORKS

1. Classroom discussion. Read the questions. You will have 2 minutes to think about them. You can write down key words. During a classroom discussion, provide an answer for each of them.

A. What are the main ingredients in making concrete?

B. Mention 2 or 3 reasons for which concrete is one of the main construction materials.

2A. Vocabulary. Provide a Romanian translation for the following words:

1. silozuri de ciment _____; 2. agregate _____;
3. aditivi _____; 4. malaxor _____;
5. stație de beton _____; 6. boxă pentru agregate_____;
7. betonieră _____; 8. cântar ciment_____;
9. cofraj _____; 10. benă ciment_____;
11. jgheab ciment _____; 12. pompa ciment _____;
13. decofrare _____; 14. bandă transportoare_____;

2B. 🎧 Vocabulary. Listen and pronounce the words discussed in Exercise 1.

URL: https://tinyurl.com/muje44jn

3. Reading - How does a concrete batch plant work? Read the text and fill in the gaps.

site; mixed; wet mix; dry mix; bigger; ensures; aggregate; concrete; needs;

Concrete plants have been designed into different types by manufacturers to suit individual a._____. These different types will help fulfill different requirements. There are two main types of concrete plants: b._____concrete plant and c._____ concrete plant.

As the name suggests, dry mix plants make recipes that are dry. All the required materials like d._____, sand and cement are weighed and then dispatched into a transit mixer. Water is added into the transit mixer. On the way to the site, concrete is e._____

In case of wet mix type machines, the materials are weighed individually and then added into a mixing unit. Also known as central mix plants, they offer a much more consistent product as all the ingredients are mixed in a central location in a computer assisted environment which f._____ uniformity of the product.

Stationary batch plants are usually preferred by contractors who want to use concrete on a single construction g._____. The size of the stationary mixers is also h._____compared to the mobile type. Mobile batch plants can be taken to job sites and used to produce i._____ as needed to meet any specification. Today, mobile batch plants are also reliable, productive, accurate and designed to perform for years to come.

(Taken and adapted from: https://tinyurl.com/bdhaacue)

4. Listening - Making concrete in batch plants. Watch the video by using the QR code or the link below.

URL:

https://www.youtube.com/watch?v=kGkbIeQD1Yo

4B. Using the information provided in the video, answer the following questions:

A. What are the types of formwork (shuttering) presented in the video?

_____

_____

_____

_____

B. Mention one advantage in using timber formwork.

_____

_____

_____

_____

C. How are steel formworks bounded together?

_____

_____

_____

_____

D. Mention one advantage in using steel formwork.

_____

_____

_____

_____

E. Do plastic formworks prevent concrete leakage?

_____

F. Mention two advantages in using aluminum formwork.

_____

_____

5. Using online resources, provide an English translation for the terms presented below.

! **Hint**: you can use the following links (1) https://www.atlasindustries.in/blog/how-does-a-concrete-batch-plant-work/ and (2) https://context.reverso.net/translation/english-romanian; or any other dictionary found online.

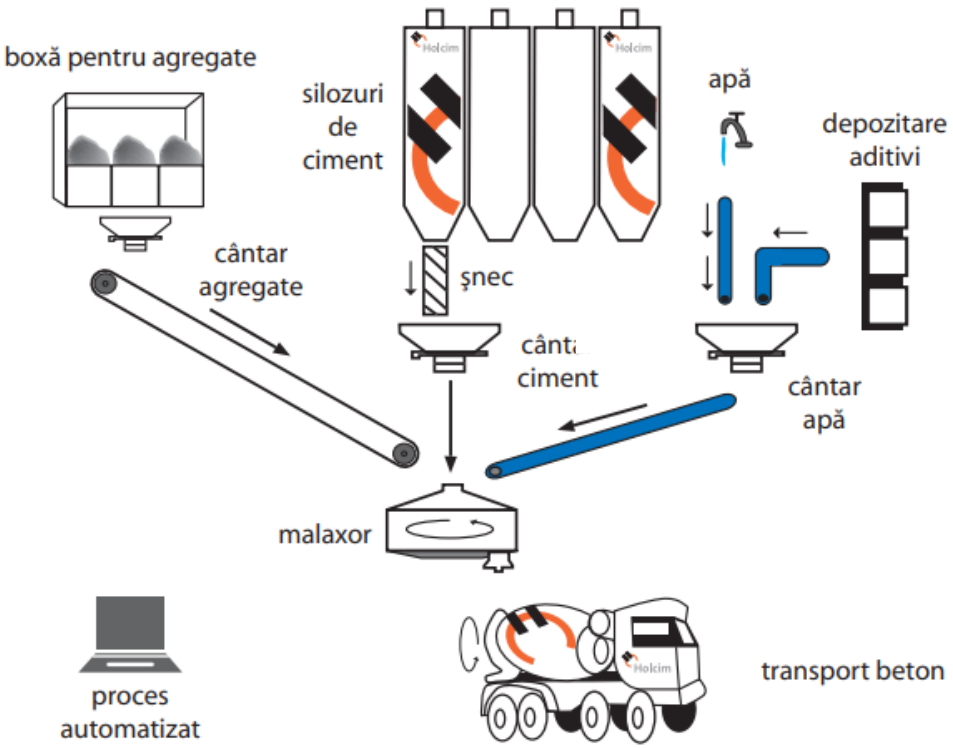

Figure 4. Making Concrete on a Batch Plant (Source: https://tinyurl.com/2p8zvnz6)

1. boxă pentru agregate _____; 2. silozuri de ciment _____;
3. depozitare aditivi _____; 4. proces automatizat _____;
5. cântar agregate _____; 6. cântar apă _____;
7. cântar ciment _____; 8. malaxor _____;
9. transport beton _____;

6. Writing- Translation. Translate the sentences from English to Romanian.

A. *Concrete is the most versatile construction material that you can work with. It can be formed to any shape and can be used for just about any purpose:* ***footings****, roofs, floors,* ***walkways****. It can be pumped in a* ***wheelbarrow****, a truck or a pump.*

_____
_____
_____
_____
_____
_____
_____

B. *The beauty of concrete, though, is that you can manipulate and control its physical properties to create the perfect combination of strenght, durability,* ***workability*** *and cost for each particular use or condition. Having a basic knolwedge of the ways that the concrete mix can be altered to suit certain use requirements and to compensate for the various weather and* ***pouring*** *conditions you may encounter is crucial to making sure you have a succesful project.*

_____
_____
_____
_____
_____
_____
_____
_____

C. *Concrete is made by combining three main ingredients: Portland cement, water, and aggregate. Cement acts as the glue in a concrete mix. Combined with water, it forms a paste that coats the aggregate and binds together the mixture. Without water, cement and aggregates would be just a* ***dry*** *mixture. Water triggers a chemical reaction to cement; known as* ***hydration****, this reaction is what makes concrete* ***harden****.*

_____

_____

_____

_____

_____

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_____

D. *The job of the aggregate – gravel and sand – is to increase the strenght of concrete while reducing its cost. Think of it as cement* ***filler****. The individual stones (****coarse aggregate****) interlock with each other, and the sand (****fine aggregate****) fils in the* ***voids****.*

_____

_____

_____

_____

_____

_____

(Taken and adapted from: Chapman, Peter, and Christina Glennon. 2018. *Foundations and Concrete Work*. Newtown: The Taunton Press Inc., pp. 16-19.)

Unit 12: Additional exercises

7. **Writing.** After going through this unit, write an essay (100-150 words) about the production, properties and usage of concrete as a main building material in civil engineering.

7. Classroom activity. **The Guessing Game**

Work in **groups of 5**.
Each student will be asked to **come in front of the classroom**.
He/she will receive a sheet of paper from the teacher containing a vocabulary word from the previous Units.
The student will have **1 minute** to (1) **define** the word (in English), (2) **mime it**, or (3) **draw it.**
His/her team members will get **two points** if they can guess the word.
During this time, the other teams can try and guess the word and **write it on a piece of paper before the time is up**.
If they have guessed correctly, the team will receive **1 point** for the effort.
The team with the most points at the end of the game will be declared the winner.

Key words: Glossary of Terms (UNIT 12)

English	Romanian
additive tank	rezervor depozitare aditivi
additives	aditivi
aggregate bins/hoppers	boxă pentru agregate
aggregate weight conveyor	cântar agregate
aggregates	agregate
automated proccess	proces automatizat
batch/batching plant	stație de beton
cement silo	siloz de ciment
cement truck/concrete mixer	betonieră
cement weigh scale	cântar ciment
chutes/drop pipes	jgheab pentru turnare ciment
coarse aggregate	agregate grosiere
concrete pump	pompă de beton
concrete skip	benă de ciment
conveyor belt	bandă transportatoare
dry	uscat
dry mix	amestec uscat
filler	umplutură
fine aggregate	agregate fine
formwork (shuttering)	cofraj
mixing unit	malaxor
pouring	turnare
stripping/dismantling	decofrare
to harden	a întări
void	gol
water weigh scale	cântar apă
wet mix	amestec umed
workability	lucrabilitate

UNIT 13: STRUCTURAL COMPONENTS IN CIVIL ENGINEERING

1A. Vocabulary. Structural components of buildings. Match the definitions (A-K) with the appropriate words (1-11).

A. *A body or ground upon which something is built up or overlaid.*	**1.** Insulation
B. *One of the sides of a room or building connecting the floor and ceiling or foundation and roof.*	**2.** Plywood
C. *Any isolated, vertical structural member such as a pier, column, or post.*	**3.** Roof
D. *A horizontal member spanning an opening and carrying a load that may be a brick or stone wall above the opening.*	**4.** Walls
E. *A structure in which the weight is carried by a skeleton or framework as opposed to being supported by walls.*	**5.** Carpentry
F. *An engineered sheet timber product that is widely used for construction purposes. It is manufactured from three or more thin layers of wood veneer that are glued together to form a thicker, flat sheet.*	**6**. Frame
G. *A set of steps leading from one floor of a building to another, typically inside the building.*	**7.** Pillar

H. *The covering found on the top of a building, serving to protect against rain, snow, sunlight, wind, and extreme temperatures.*	**8.** Beam
I. *The art and trade of cutting, working, and joining timber. The term includes both structural timberwork in framing and items such as doors, windows and staircases.*	**9.** Staircases
J. *A means of reducing the transmission of thermal energy through walls, ceilings, and floors. In simple terms, this helps keep heated interior space warmer in the winter, and air-conditioned spaces cooler in the summer.*	**10.** Foundation
K. *These are used in the final part of the construction or manufacturing process, forming the final surface of an element.*	11. Finishes

(Adapted from: https://tinyurl.com/bde9fy84; https://tinyurl.com/2p3m37p4; https://tinyurl.com/4dcjzn69)

1B. 🎧 **Vocabulary.** Listen and pronounce the words discussed in Exercise 1.

URL: https://tinyurl.com/4y7uatnb

2. Types of structures and building components- Use the words from exercise 2 and fill-in the blanks:

Tall skylines anchored by impressive skyscrapers have been the staple image of large American cities, dominated by office towers and a few residential condominium skyscrapers. However, **A**._____, and even skyscrapers are starting to claim more and more spots on urban skylines.

B._____ include the smallest buildings produced in large quantitites. From single-family houses to three stories blocks, these types of buildings are prevalent in urban areas and in suburbs as they offer a high degree of comfort.

C._____ are very large, usually high-rise building or a complex of such buildings used for many purposes, as for apartments, offices, stores, theaters or athletic facilities.

A structure built as a vertical extension of something else such as all of the building above a basement or the structural part of a ship above the main deck is known as a **D**._____.

The **E.**_____ is the lowest part of a building which is constructed below the ground level. The function of it is the transfer of the loads from the superstructure to the underlying soil.

A **F.**_____ is a wall that supports vertical load in addition to its own weight and is an active structural element of a building.

A G._____ is any fire-resisting construction (loadbearing or non-load bearing) that forms part of one or more compartments designed to help contain the spread of fire for a designated period of time.

A wall forming the external enclosure of a building is known as an H._____

(Text adapted from: https://tinyurl.com/2p3m37p4; https://tinyurl.com/7w5ffr36; https://tinyurl.com/yft8fzy3; https://tinyurl.com/4dcjzn69)

3. **Pre-reading exercise.** Provide a Romanian translation for the following terms:

1. substructure _____; 2. superstructure _____;
3. load bearing walls _____; 4. compartment walls _____;
5. external walls _____; 6. megastructure_____;
7. high-rise buildings _____; 8. low-rise buildings_____;

4. **Reading.** The following link contains information on different types of structures used in the field of Civil Engineering. Read the article provide a definition for all the structures found in the table below.

URL: https://tinyurl.com/2p8v54ny

Type of structure	Definition
load bearing structure	
truss structure	
framed structure	
cables and arch structures	
composite structure	

4B. After reading the text from exercise 4A, write 3-4 advantages and disadvantages for (1) load bearing structures and (2) composite structures.

Type of structure	Advantages	Disadvantages
load bearing structure	1. 2. 3. 4.	1. 2. 3. 4.
composite structure	1. 2. 3. 4.	1. 2. 3. 4.

5. Writing. Make sentences with the words provided below:

A. megastructure:

_____

B. load bearing:

_____

C. beams:

_____

D. low-rise buildings:

_____

E. superstructure:

_____

F. plywood:

_____

G. finishes:

_____

6. Reading. Read the text and fill in the gaps.

staircase, weight, roof, superstructure, walls, substructure, floor, components, concrete, foundation

A building's structure components are the physical elements that support its **a**. _____, as well as any additional weight the building may bear while it stands. Because the engineering behind buildings is largely the same from building to building, you can find the same structure components in almost all types. These structure components fit into two categories: the **b**. _____, which is above the ground, and the **c**. _____, which is below the ground.

Here are some of the most common building structure **d**. _____:

The **e**. _____ is the lowest load-bearing part of a building. It is usually made from **a**. **f.** _____ and it is the first component built. It distributes the weight from the structure on top evenly onto the soil underneath it.

The **g**. _____ is a flat horizontal surface that supports people and furniture. The purpose of this component is to provide a dry and hygienic ground to your structure. **h**. _____ are vertical structure components that support the roof. They also provide security and protection from outside weather. You can use a variety of materials to construct it. The **i**. _____ is the uppermost structural element of a building. It provides covering for the rest of the structure to protect it from weather. You can construct it flat or sloped out of a variety of materials, depending on what is best suited for the weather of the region. A **j**. _____ is made up of a collection of steps that allow movement from one floor to another. It has to bear its own weight and anyone walking on it. You can consider the space available when deciding its layout, as well as the materials used.

(Taken and adapted from: https://tinyurl.com/fvt28hkx)

Unit 13: Additional exercises

7. **Reading and Writing-** Access the link and read about the Romanian Palace of Parliament. After going through the video, describe the building in an essay (120-150 words). Use at least 10 word discussed during this unit.

URL:
https://www.youtube.com/watch?v=opoGlCP2Co

Key words: Glossary of Terms (UNIT 13)

English	Romanian
beam	grindă
cable and arch structure	structuri din cabluri și arce (bolte)
carpentry	tâmplărie/prelucrarea lemnului
compartment walls	ziduri despărțitoare/ pereți despărțitori
composite structure	structuri din compozite
external walls	ziduri exterioare/pereți exteriori
finishes	finisaje
frame	cadru
framed structure	structură în cadre
high-rise buildings	clădiri înalte
insulation	izolații
load bearing structure	structuri de rezistență
low-rise buildings	clădiri joase/ clădiri cu puține niveluri
megastructure	megastructură
pillar	stâlp/pilon
plywood	planșeu
staircases	scări
substructure	substructură
superstructure	suprastructură
truss structure	structură cu ferme

UNIT 14: SOME CONSIDERATIONS ON THE FUTURE OF CIVIL ENGINEERING

1A. Vocabulary – The Future of Building materials. Match the words with their definition. Take into account the definition and use for each building material.

A. Definition: *concrete with water-activated bacteria that produces calcite to heal cracks.*	**Use:** *lessen infrastructure maintenance requirements and cutting greenhouse gases.*	**1**. transparent aluminum
B. Definition*: prefabricated timber with higher water resistance and strength over traditional wood.*	**Use**: *potential to support Skyscrapers and reduce 150 tons of carbon per story.*	**2.** self-healing concrete
C. Definition*: ceramic alloy that is 85% harder than sapphire and resistant to corrosion, radiation and oxidation.*	**Use**: *possibilities include windows and domes for undersea and space vehicles.*	**3.** spider silk
D. Definition*: color-stripped wood with better insulation, strength, and biodegradability.*	**Use**: *solar panel cells, natural indoor lighting and modern structures.*	**4.** laminated timber
E. Definition*: concrete that is embedded with minuscule glass balls to reflect light.*	**Use***: signage systems, artistic buildings, lighting underground spaces and marking dangerous areas.*	**5.** light-generated concrete

F. Definition: *provides 340 times more durability than steel and contains resonance properties.*	**Use**: *synthetic spider silk variants could be used for acoustic building tiles and laboratories.*	**6.** wool brick
G. Definition: *fused with wool and seaweed polymer and offers 37% more strength than earth brick.*	**Use**: *reducing greenhouse gases from firing traditional bricks and increasing building cold climate resistance.*	**7.** pollution-absorbing brick
H. Definition: *it is a double layered, insulated brick able to filter 30% of fine pollutants and 100% of coarse pollutants.*	**Use**: *it can filter air and create a self-sustaining ventilation system for green buildings.*	8. translucent wood

(Taken and adapted from https://tinyurl.com/4zxanjrj)

1B. 🎧 Vocabulary. Listen and pronounce the words discussed in Exercise 1.

URL: https://tinyurl.com/2nkeaes6

2. Reading. Read the text and fill-in the blanks.

quite; enormously; stations; spacecraft; command centers; astronauts; degree; minority; invaluable; terraforming; payloads; supply; exploration;

Many children dream of working as part of the space programme. The very young want to be **a**. _____ and travel through space, exploring new planets. As they get older, they realise that only a small **b**. _____ of people become astronauts and that space travel isn't what they once imagined. These people look at other careers within the space programme and consider work in astronomy, science, engineering or computer science. Very few think of civil engineering. However, civil engineers play a **c**. _____role in the space programme.

Here is a look at what civil engineers do and why an online civil engineering **d**. _____ could one day see you working in the space programme.

One place they could do this work for the space programme is the design and manufacture of **e**. _____ for space projects. These centres must be large enough to house different departments as well as runways, warehouses and hangers, so it can be an interesting job.

Another area where a civil engineer's skills are **f**. _____ is the creation of launch platforms. A launch platform is used to launch **g**. _____ both into and beyond Earth's atmosphere. This is a challenging job as there are many different factors, such as weight and fuel **h**. _____ lines to be considered.

Civil engineers aren't just needed for structures on Earth. They also work with structural engineers, astrophysicists and scientists to design space **i**. _____ in much the same way as they would work on an oil rig on Earth.

Proposed space elevators are long cables, fixed on Earth near the equator and reaching out into space, for transporting **j**. _____ into low Earth orbit and back.

They have the potential to reduce the cost and time of space access **k**. _____. While this may seem like a thing for the future, there are already patents and designs in place, which civil engineers will be helping with.

l. _____ is the process of making another planet hospitable for human life. We've all seen it in movies and it is not something that is likely to be needed for **m**. _____ some time. However, those working in the space programme are researching ways to make terraforming possible, efficient and successful. Civil engineers are already working in the field but, in the future, when this process is essential to our **n**. _____ of other planets, civil engineers will have a much bigger role to play.

(Taken and adapted from https://tinyurl.com/3jwsh6ak)

3. Listening- Self-healing concrete. Access the link, watch the video and answer the follow-up questions:

URL:
https://www.youtube.com/watch?v=H7frDSx9js8

A. What is the main flaw of regular concrete as a building material?

_____

_____

_____

B. How does self-healing concrete work?

_____

_____

_____

_____

_____

C. Mention 3 advantages of self-healing concrete.

_____

_____

_____

D. Mention 2 future uses for self-healing concrete.

_____

_____

_____

4. Reading- Future trends in civil engineering. Read the text and answer the questions:

As far as highways go, there are household names travelers are familiar with: Route 66, Pacific Coast Highway, Germany's autobahn. These iconic roads are the stuff of legends.
Norway is expected to insert their name amongst this list with massive improvements on their already impressive E39 highway along its coastline.

About a third of the country's population lives along Norway's western coast. Creating a monolithic, continuous highway will connect the entire west coast of Norway and is predicted to benefit the country both economically and socially. With the main goal of reducing travel time by half, both locally and on the whole stretch, the project is estimated to cost a staggering grand total of $47 billion dollars.
The multidisciplinary project requires people with knowledge in safety, materials technology, social economics, structural engineering, operation and maintenance, climate and environment, etc. The various fjords, long, narrow, deep, inlets of the sea, are going to be a challenge for engineers.

Tore Askeland, the project manager, noted “The Sulaforden Crossing is the toughest crossing due to the harsh environment close to the Atlantic Ocean. We are currently measuring wind and waves and it will not be easy to build and operate it. An open bridge can be closed due to too much wind, “he continued to note, “A submerged floating tube bridge can be the solution, but we don’t know yet.”

Using bridges to connect points of land between fjords is the focal point of the project. “The fjords are deep, which means traditional bridges, with pillars to the bottom, are not possible,” said Tore.

This project is filled with many “firsts,” “largest,” and “longest” titles for many of these bridges. A 5km long floating bridge to cross Bjørnafjorden is also in development, in combination with a long cable-stayed bridge, which can turn out to be the longest in the world, according to Tore. He also made sure to inform me that they plan on building the longest and deepest subsea road tunnel to cross Boknafjorden, north of Stavanger.

Practicing safe, eco-friendly, and sustainable building methods is of paramount importance for any and all major projects. A massive safety concern is that ships could accidently collide into bridges. Hence, bridges must be tall enough to still allow for the heavy flow of shipping traffic seen at such fjords.

Other safety concerns include making sure the number of traffic fatalities or incidents is no higher than the Norway national average, which is quite low, and to reduce the risk related to fires in the tunnels, which would be a nightmare in some of the longer tunnels in the project.

As Norway continues to embark on the largest infrastructure project in the country’s history, the world cannot help but be marveled at what they will accomplish in the years to come. When a project is finished, it will call for the ultimate road trip.

(Taken and adapted from: https://tinyurl.com/2v666avn)

A. What are the main reasons for which the coastal highway is being made?

_____

_____

B. Approximately how expensive will the project be?

_____

C. Mention 2 difficulties encountered by engineers when designing the coastal highway.

_____

_____

_____

_____

D. What are some innovations that would be part of the construction project?

_____

_____

_____

_____

E. What should the design engineers take into account when making bridges?

_____

_____

_____

F. Mention 2 safety concerns that engineers have in mind when making the traffic infrastructure.

_____

_____

_____

_____

G. If the project will be finished in the future, would you like to travel on those roads? If yes, please justify your answer.

_____
_____
_____
_____
_____

5. Writing- translation. Translate the fragments from English to Romanian.

A. *Earthquake engineering is a subdivision of structural engineering that focuses on designing structures capable of* ***withstanding t****he immense levels of stress caused by* ***seismic*** *forces. Civil engineers specializing in this field usually work in geographic areas that frequently experience earthquakes, allowing them to test new technologies in real-world earthquake scenarios.*

_____
_____
_____
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_____

B. *The seismic waves caused by earthquakes weaken the stability of buildings. To withstand an earthquake, buildings need to be designed with seismic control—especially taller buildings, as their* ***collapse*** *could cause significant damage. One inexpensive method of achieving seismic control is base isolation. This passive method isolates the base of a structure from its foundation using a set of lead-rubber* ***bearings*** *within the structure's foundation that can effectively deflect or absorb the vibrations caused by seismic waves.*

_____
_____
_____
_____
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_____
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_____

C. *Antarctica New Zealand is on the lookout for a new contractor to* ***redevelop*** *a science research station in the world's southernmost continent. The new base is a* ***self-sustaining*** *facility comprised of three interconnected buildings. These two-storey buildings are designed to meet the unique* ***constraints*** *that building in Antarctica poses while supporting world-leading science. Constraints include temperature extremes with an annual low of -50°C, coupled with very high winds, extremely low humidity and a four-month summer season.*

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_____

(Paragraphs A and B were taken and adapted from: https://tinyurl.com/3w6jktsr; paragraph C was taken from: https://tinyurl.com/yse8keh4)

6. **Writing.** Using 10 elements of vocabulary discussed during this lesson, write a short essay 120-150 words about future trends in the field of civil engineering.

Unit 14: Additional exercises

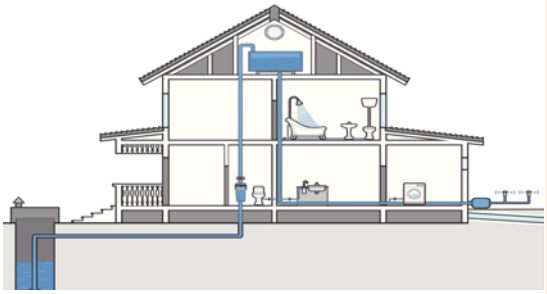
7. **Classroom activity**. Go to pages 140-142 and choose an interactive classroom activity.

Key words: Glossary of Terms (UNIT 14)

English	Romanian
bearings	rulmenți
collapse	prăbușire/colaps
constraints	constrângeri
invaluable	neprețuit
laminated timber	cherestea laminată
light-generated concrete	beton generat de lumină
payload	încărcătură
pollution-absorbing brick	cărămidă care absoarbe poluarea
seismic activity	activitate seismică
self-healing concrete	beton autoreparant
self-sustaining	auto-susținut
spacecraft	navă spațială
spider silk	mătase de păianjen
terraforming	terraformare
to redevelop	a reamenaja
to whitstand	a suporta/a rezista
translucent wood	lemn translucid
transparent aluminium	aluminiu transparent
wool brick	cărămidă de lână

UNIT 15: PLUMBING FIXTURES

1. Reading exercise – Plumbing at home: a basic guide. Read the text.



(taken from https://tinyurl.com/ynacp8ym)

Every home has a plumbing system that helps with water supply and waste removal. Wheter you live in a house or an apartment, it's important to understand how these system work and what common problems can occur.

The plumbing system includes several key parts: the water supply, the drainage system, and the fixtures. Fixtures are things like the sink, toilet, and bathtub. These are connected to the main pipe, which brings in cold water and hot water through a distribution network.

Water enters the house through a copper pipe under the concrete slab. There is a shut off valve that allows you to stop the water flow if needed. From there, the water goes to different fixtures. If the water pressure is too low, you may need to check the shut off valve or the insulation around the pipes.

Sometimes, problems happen. A slow drainage in the sink might mean the pipe is clogged. You can fix this with a drain snake or call a plumber. If there is a water leak, it could be caused by a broken gasket or poor sealing.

Homes not connected to a municipal drain use a septic tank. Waste is pumped out by a vacuum truck. Rainwater is collected in gutters and directed away from the house to prevent flooding.

In industrial plumbing systems, the equipment is larger and more complex. Residential plumbing systems are simpler but still need regular maintenance and repair.

To keep your plumbing system working well, use corrosion-resistant materials, especially if you have hard water, which can cause rust.

Understanding these basic terms and systems helps you communicate better with professionals and take care of your home. Whether you're fixing a leak or installing a new faucet, knowing the vocabulary makes everything easier!

(Microsoft Copilot. (2025). *Plumbing in the Home: A Basic Guide* [AI-generated educational text]. Retrieved from Copilot chat).

2. Vocabulary. Provide a Romanian translation for the following words**:**

sink _____; toilet _____; bathtub_____;
main pipe_____; cold water _____; hot water_____;
concrete slab_____; shut off valve _____;
insulation_____; slow drainage _____;
clogged_____; water leak _____; gasket_____;
municipal drain_____; septic tank _____;
vacuum truck _____; rainwater _____;
gutters_____; maintenance_____; repair_____;
hard water_____; rust _____; faucet _____;

3. **Mix and Match exercise.** Match each plumbing term (A-T) with the correct definition (1-20). Write the correct number next to each letter.

A. A system of pipes that delivers water to homes and buildings

B. A thick layer of concrete at the base of a house or building.

C. A device that stops or allows water flow in a pipe.

1. Faucet

2. Vacuum truck

3. Rust

D. When water drains very slowly from a fixture.	**4.** Sealing
E. When a pipe or drain is blocked and water can't pass through.	**5.** Distribution network
F. Water escaping from a pipe or fixture.	**6.** Gasket
G. A rubber or metal ring that helps seal pipe joints.	**7.** Municipal drain
H. The process of making something watertight or airtight.	**8.** Hard water
I. The public sewer system under the street.	**9.** Gutters
J. An underground tank for waste in homes without sewer access.	**10**. Water leak
K. A truck that removes waste from septic tanks using suction.	**11**. Clogged
L. Water that falls from the sky.	**12**. Shut off valve
M. Channels that collect and direct rainwater from the roof.	**13**. Rainwater
N. Regular checking and fixing of systems to keep them working.	**14**. Concrete slab

O. Water with high mineral content that can damage pipes.	**15**. Corrosion-resistant material
P. A reddish-brown substance caused by metal corrosion.	**16**. Septic tank
Q. A device you turn to get water from a pipe.	**17**. Maintenance
R. A type of pipe or material that does not get damaged by rust or minerals.	**18**. Slow drainage

4. Translation. Translate the following sentences from Romanian to English

A. ***Instalațiile sanitare de interior*** *sunt conductele de apă caldă și de apă rece trase prin pereți, care conectează rețeaua externă de apă la echipamentele tehnice sau la* ***chiuvete, toalete*** *și* ***căzi****. Tot în interior trebuie să ții cont și de* ***conductele de canalizare****.*

_____
_____
_____
_____
_____
_____

B***. Instalațiile sanitare de exterior*** *sunt conductele folosite pentru a transporta apa către locuință și* ***reziduurile menajere*** *către rețeaua de canalizare. În cazul în care nu există o astfel de rețea, trebuie să iei în calcul instalarea unei* ***fose septice*** *într-o zonă retrasă a curții, care permite accesul unei* ***vidanje****.*

_____
_____
_____

_____
_____
_____
_____
_____

C. ***Instalația de apă rece*** *– conductele de apă rece alimentează întreaga locuintă cu apă, inclusive* ***echipamentele de termoficare*** *sau* ***de încălzire a apei*** *(boiler,* ***centrală termică****, etc.). Aceste conducte trebuie să fie* ***rezistente la corodare****, la acțiunea* ***apei dure*** *și nu trebuie să* ***ruginească****. Este foarte important ca acestea să reziste la* ***presiuni ridicate.***

_____
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_____
_____
_____
_____
_____
_____

D. ***Instalația de apă caldă*** *– cel mai important lucru în cazul* ***sistemului de alimentare cu apă caldă*** *sunt conductele care o formează. Acestea trebuie să fie din materiale rezistente la temperaturi ridicate.*

_____
_____
_____
_____
_____
_____

E. ***Instalația de canalizare****- înainte să începi lucrările la sistemul de canalizare din locuința ta, trebuie să iei în calcul un aspect foarte important:* ***debitul maxim*** *al* ***apei menajere*** *din bucătărie și din baie. De asemenea, nu uita să alegi* ***materiale rezistente*** *pentru* ***conductele de scurgere****, ca să nu riști un accident.*

_____
_____
_____
_____
_____
_____

(Taken and adapted from: https://tinyurl.com/3zw94ssd)

5. Comprehension exercise. **Outdoor plumbing systems.** Look at the definitions and match them with the terms. After the end of this exercise you should be able to define the following terms:

Water supply source; **water abstraction systems**, **pumping stations**, **water treatments plants**, **water storage tanks**, **distribution networks**

A. Acest sistem realizează distribuția apei în centrul populat printr-o rețea de conducte urmărind rețeaua stradală a localității.

_____

B. Aceste instalații preiau apa de la sursă și o introduc în sistemul de transport al apei. Se realizează în moduri diferite, după proveniența apei (captări din ape de suprafață și captări din ape de adâncime).

_____

C. Asigură cantitatea de apă pentru toate nevoile de consum (băut, igienă, hrană, animale, industrie, etc.), pe cât posibil în condiții de calitate a apei dcât mai apropiate de cele necesare consumatorului.

_____

D. Asigură mişcarea apei în sistemul de alimentare de la sursă până la cei mai dezavantajaţi consumatorii şi pot lipsi în situaţia unor surse amplasate la o cotă geodezică (altitudine, înălţime) suficient de mare faţă de platoul (zona) pe care este amplasat centrul populat deservit, pentru ca gravitaţional (prin cădere liberă), apa să ajungă până la cele mai dezavantajate puncte de consum.

_____

E. Au rolul de formare a unei rezerve de apă, de regulă cel puțin două în paralel amplasate la limita centrului populat, astfel încât să asigure compensarea variațiilor de debit.

_____

F. Asigură corectarea calităţilor (proprietăţilor) apei de la sursă astfel încât acestea să răspundă cerinţelor de calitate a consumatorului şi pot fi mai simple sau mai complexe după cum calitatea apei la sursă este mai mult sau mai puţin bună. _____

(Taken and adapted from: https://tinyurl.com/bttasr2x)

Unit 15: Additional exercises

6. Materials used for outdoor water supply networks. Various materials are used for outdoor plumbing systems. Look at the pictures below. Write down the name in Romanian and/or English. Discuss the terms with your teacher.

A home's plumbing system is composed of four things: waste drains, waste vents, potable water, rain water. Let's go to each process one by one and talk about what they do.

A. WASTE DRAINS

Let's start off with the drains. Most homes have either **ABS**, **PVC** or **Cast Iron drainpipes** and **vents**. These pipes are connected to all the **fixtures** in the home such as toilets, sinks, bathtubs and showers. When the fixtures are used, the **waste** is carried inside the drainpipes that have a slight **slope** to them, down the main drain until it reaches the **municipal drain** under the street. Sometimes, on the main drain pipes, you will find **cleanouts**. These are what give you access to the inside of the pipes in case there's a blockage.

Some homes, however, don't have municipal services so they are not connected to a main municipal drain. So how do they get rid of their waste? The main drain pipe that would normally go to the sewers, goes to what is known as a **septic tank**. The waste needs to be pumped out by a **vacuum truck** in order to make sure that the system functions properly.

B. WASTE VENTS

For the fixtures and vents to function properly, the system needs to be properly vented. The vents restrict sewer gases to find their way inside your home. These vents get their air through the roof and need to be constantly clear. The vents also relieves pressure build up inside the actual municipal sewer line. Some cities had their **manhole covers** blast up 50 feet in the air because rats would chew on electrical wires and would, in turn, create a spark and ignite the methane gas inside the sewers. So the vent minimizes the chance of this happening.

C. POTABLE WATER

Potable water comes from below the streets like the other services. Every home with a water supply from this city has to have a **shut off valve** in case the city needs to close the water. A copper line comes into the basement through the **concrete slab** to another shut off valve which is only accessible to the homeowner. This grants access to both hot water and cold water.

D. RAINWATER MANAGEMENT

In the past, rainwater and sewage was combined, meaning that rainwater went into the same sewage as the waste from your house. Since then, they've been separated to make water management easier. When it rains, all of this water has to go somewhere. The rain that falls on the house's roof trickles into the **gutters**. The gutter diverts the water away from the house to prevent water infiltration.

The rainwater dumps itself into a nearby river and the waste goes through a **sewage treatment plant** and passes through multiple **filters and treatment stages** and then is released back into the nearest river and the cycle continues. The water from the river is filtered and pumped back into the city's main as potable water which is safe to drink. And that's basically how your plumbing system works!

(Taken and adapted from: https://tinyurl.com/jwepsakk)

6B. Translate the following terms:

cast iron _____; vents _____; fixtures _____;
waste _____; slope _____; vacuum truck _____;
septic tank _____; municipal drain _____; gutters _____;
concrete slab _____; sewage treatment plant _____;
shut off valve _____; cleanouts _____;

6C. Answer the following questions:

A. In simple terms, explain the process through which waste is transported from a house to a municipal drain.

_____
_____
_____
_____
_____
_____
_____

B. How can you get rid of waste if the house is not connected to a municipal drain?

_____
_____
_____
_____
_____

C. Why are waste vents important? What do they do?

_____
_____
_____
_____
_____

D. What happens to all the rainwater and collected waste?

_____
_____
_____
_____
_____
_____

Key words: Glossary of Terms (UNIT 15)

English	Romanian
Plumbing system	Sistem de instalații sanitare
Water supply	Alimentare cu apă
Drainage system	Sistem de drenaj
Fixtures	Accesorii sanitare
Sink	Chiuvetă
Toilet	Toaletă
Bathtub	Cadă de baie
Main pipe	Țeavă principală
Distribution network	Rețea de distribuție
Copper	Cupru
Concrete slab	Placă de beton
Shutoff valve	Supapă de închidere
Water flow	Debit de apă
Drainage	Drenaj
Clogged	Înfundat
Drain snake	Sârmă de desfundat
Leak	Scurgere
Gasket	Garnitură
Poor sealing	Etanșare defectuoasă
Municipal drain	Canalizare municipală
Septic tank	Fosă septică
Vacuum truck	Vidanjă
Rainwater	Apă de ploaie
Gutters	Jgheaburi
Corrosion-resistant materials	Materiale rezistente la coroziune
Hard water	Apă dură
Rust	Rugină
Faucet	Robinet
Indoor plumbing systems	Instalații sanitare de interior
Wastewater pipes / Drain pipes	Conducte de canalizare
Household waste / Domestic waste	Reziduuri menajere
Cold water system	Instalație de apă rece
Hot water system	Instalație de apă caldă
District heating equipment	Echipamente de termoficare
Hard water	Apă dură
Water flow	Debit de apă

English	Romanian
Wastewater	Apă menajeră
Water supply source	Sursă de alimentare cu apă
Water abstraction systems	Sisteme de captare a apei
Pumping station	Stație de pompare
Water treatment plants	Stații de tratare a apei
Water storage tanks	Rezervoare de stocare a apei
Waste drains	Canale de evacuare a deșeurilor
Cast iron	Fontă
Vents	Aerisiri
Slope	Pantă
Cleanouts	Guri de curățare
Manhole cover	Capac de canal
Sewage treatment plant	Stație de epurare a apelor uzate

UNIT 16: HEATING FOR BUILDING SERVICES

1. Vocabulary. Match the words with the pictures:

furnace, ductwork, boiler, radiator, heat pump, insulation, underfloor heating, thermostat, flue

A. _____; B. _____; C. _____;

D. _____; E. _____; F. _____;

G. _____; H. _____; I. _____;

(Images taken from https://tinyurl.com/3ukjdmnz and https://pixabay.com/)

2. Provide a Romanian equivalent for the following terms:

A. Boiler _____; B. Furnace _____;

C. Radiator _____; D. Underfloor Heating _____;

E. Heat Pump _____;

F. HVAC _____;

3. Reading Exercise. 1. Reading exercise.

A. Heating for building services

Heating systems play a crucial role in maintaining a comfortable **indoor** environment, especially during colder months. In building services, heating systems ensure that buildings are kept warm, enhancing comfort for occupants and protecting the structure from cold-related damage. Several key components and systems are commonly used in building heating.

B. Central Heating systems

Central heating systems are the most common type of heating installations in buildings. They use a central heat source, such as a boiler or a furnace, to generate heat. This heat is then distributed throughout the building via a network of pipes or ducts. Common central heating systems include:

- **Radiators:** These are heat exchangers that transfer heat from hot water or steam into the surrounding air. They are usually located in each room of the building.
- **Underfloor Heating:** This system involves installing a network of pipes or electric heating elements beneath the floor, providing even heat distribution across the room.

C. Heat Pumps

Heat pumps are energy-efficient heating systems that transfer heat from one place to another. They can extract heat from the air, ground, or water and use it to heat buildings. There are several types of heat pumps, including:

Air Source Heat Pumps: These systems extract heat from the outdoor air and transfer it indoors.

Ground Source Heat Pumps: Also known as geothermal heat pumps, these systems extract heat from the ground using a series of underground pipes.

D. HVAC Systems

HVAC (Heating, Ventilation, and Air Conditioning) systems provide both heating and cooling to buildings. They are designed to maintain a comfortable indoor climate by regulating temperature, humidity, and air quality. HVAC systems can include:

Furnaces: These heat the air and distribute it through ducts.

Heat Recovery Ventilators (HRVs): These systems recover heat from exhaust air and use it to preheat incoming fresh air.

(Text taken and adapted from https://tinyurl.com/4fudc648)

4. Provide a Romanian translation for the following definitions and match them with the words from exercise 1A.

A. A system for Heating, Ventilation and Air Conditioning that regulates indoor climate.

_____

_____

_____

_____

B. A heat exchanger that transfers heat from hot water or steam to the air.

_____
_____
_____

C. A device that produces steam for heating.

_____
_____
_____

D. A device that heats air and distributes it through a building.

_____
_____
_____

E. A device that transfers heat from one place to another.

_____
_____
_____

F. A system that heats the floor surface to distribute heat evenly.

_____
_____
_____

5. Vocabulary. Using online dictionaries or by consulting the the teacher, provide a Romanian translation for the words and match them with their definition:

1. BOILER; 2. RADIATOR; 3. THERMOSTAT; 4. FURNACE;
5. HEAT EXCHANGER; 6. HVAC; 7.HYDRONIC HEATING;
8. ZONE HEATING; 9. FORCED AIR SYSTEM;
10. GEOTHERMAL HEATING; 11. RADIANT HEATING;
12. HEAT PUMP; 13. COMBUSTION CHAMBER;
14. DUCTWORK; 15. FLUE.

A. A system that delivers heat directly to the floor, walls, or ceiling. _____

B. A device that transfers heat between two or more fluids. _____

C. A heating system that uses water or a water-based solution as the heat transfer medium. _____

D. A device that regulates the temperature of a heating system. _____

E. A system of ducts used for distributing heated or cooled air throughout a building. _____

F. Systems that provide heating, cooling, and air circulation in a building. _____

G. An appliance used for heating buildings by burning fuel. _____

H. A heating method that uses the earth's natural heat. _____

I. A system that allows different areas (zones) of a building to be heated independently. _____

J. The part of a furnace or boiler where fuel is burned. _____

K. A device that heats water or produces steam for heating and hot water supply. _____

L. A pipe or duct that conveys exhaust gases from a heating system to the outside. _____

M. A heating system that uses air as the heat transfer medium and distributes it through ducts. _____

N. A heat exchange device that transfers heat to the surrounding air. _____

O. A device that transfers heat from a cooler space to a warmer one, making it useful for both heating and cooling. _____

6. Fill-in-the-blanks with the appropriate terms:

1. The _____ in the living room was not heating up properly, so I called a technician to fix it.
2. In the winter, our house is kept warm by a gas-powered _____.
3. A _____ system uses water to distribute heat through pipes and radiators.
4. The _____ allows us to control the temperature of different rooms individually.
5. The technician checked the _____ for any blockages to ensure the exhaust gases could exit the building.
6. An efficient _____ system can provide both heating and cooling for a building.
7. The _____ transfers heat between two fluids without mixing them.
8. In colder months, the _____ moves heat from the ground into the house.
9. The _____ is a crucial part of the furnace where fuel is burned.
10. _____ heating directly warms the floor, walls, or ceiling to create a comfortable indoor environment.
11. The _____ uses air ducts to distribute warm air throughout the building.
12. A _____ is responsible for heating water or producing steam for heating purposes.
13. _____ systems use the earth's natural heat to provide energy-efficient heating.
14. Regular maintenance of the _____ is essential to ensure even distribution of heated air.
15. We installed a _____ to automatically adjust the indoor temperature based on our preferences.

(Exercise adapted from Microsoft Copilot 2025)

Unit 16: Additional exercises

7. Communication – Vocabulary Charades

Students will act out heating-related terms without speaking, while others guess the word.

Instructions:

- Vocabulary terms will be written on slips of paper and placed in a container;
- The classroom will be divided into two teams;
- One student from Team A draws a slip and has 60 seconds to mime the word;
- Team A guesses the word. If they guess correctly, they earn 1 point.
- If not guessed, Team B gets the chance to steal the point.
- The team with the most points wins!

Key words: Glossary of Terms (UNIT 16)

English	Romanian
boiler	boiler
central heating systems	system de încălzire central
combustion chamber	cameră de ardere
ducts	conducte
ductwork	rețea de conducte
energy-efficient systems	sisteme eficiente energetic
flue	coș de fum/conductă de evacuare
forced air system	sistem cu aer forțat
furnace	cuptor
geothermal heat pumps	pompe de căldură geotermale
geothermal heating	încălzire geotermală
heat exchanger	schimbător de căldură
heat pump	pompă de căldură
heat pumps	pompe de căldură aer-apă
heat recovery ventilators	ventilatoare cu recuperare de căldură
HVAC system	sistem HVAC
hydronic heating	încălzire hidronică
indoor	interior
network of pipes	rețea de țevi
outdoor	exterior
radiant heating	încălzire radiantă
radiator	radiator
thermostat	termostat
underfloor heating	încălzire prin pardoseală
underground pipes	țevi subterane
zone heating	încălzire pe zone

UNIT 17: PLUMBING TOOLS AND FIRE PROTECTION IN BUILDING SERVICES

1. **Classroom discussion.** Take a minute and think of some tools (used in plumbing installations) that you already know in English. Write them down and discuss them with your teacher.

_____
_____
_____
_____
_____
_____
_____
_____

2A. Vocabulary- Plumbing tools. There are many different tools that can be used in civil engineering. Below, you can find a definition for some tools. After reading the information, use online resources to provide a Romanian and English definition for each term.

Tools (in English)	Definition	Romanian Translation
	A small door in a wall or ceiling that lets workers reach pipes or **wires**.	
	A special part in a drain pipe that stops dirty water from flowing **backward** into a building. It helps protect homes from flooding, especially during heavy rain or when the sewer system is full.	
	A device used to start or stop the flow of water or gas in a pipe. It has a round ball inside with a hole through it.	

Tools (in English)	Definition	Romanian Translation
	A part in a pipe that lets water or gas flow in only one direction. It automatically stops the flow from going backward.	
	A short, straight piece of pipe with **threads** on one or both ends. It is used to connect two plumbing parts like pipes, **valves**, or **fittings**.	
	Plastic pipes made from a material called polyvinyl chloride. They are used to carry water or waste in homes and buildings.	
	A large underground container that holds and treats dirty water (wastewater) from toilets, sinks, and showers in buildings that don't use a city sewer system.	
	A curved part of a pipe under sinks, showers, or toilets. It holds a small amount of water to block bad smells from coming up from the sewer.	
	A pipe that goes up from your drain system to the outside air, usually through the roof. It helps air flow into the plumbing system so water and waste can move **smoothly**.	
	A curved piece of pipe that changes the direction of water or gas flow. It's shaped like a **bend** and usually turns the pipe 90° or 45°.	
	A connector shaped like the letter T. It joins three pipes together and lets water or gas flow in two directions.	
	Hand tools used to cut plastic pipes, like PVC, quickly and cleanly. They look like strong scissors and are easy to use.	

Tools (in English)	Definition	Romanian Translation
	A tool used to **bend** pipes into different shapes or angles without breaking them**.** It helps plumbers fit pipes around walls, corners, or other obstacles.	
	A special tool used to tighten or loosen nuts on **faucets**, especially in hard-to-reach places under sinks.	
	A heavy tool used by plumbers to hold and turn round pipes. It has strong jaws with teeth that **grip** the pipe tightly so it doesn't **slip**.	
	A tool used to grip and turn round objects like pipes, filters, or jars without **scratching** them. It has a strong rubber or fabric **strap** that **wraps** around the item and tightens as you pull.	
	A long, flexible tool used to clear **clogs** from inside pipes. You push it into the drain, twist it, and it grabs or breaks up the blockage.	
	A special tool used to clear clogs from toilets. It's a type of drain snake made just for toilets, with a curved tip that won't scratch the bowl.	

(Definitions taken and adapted from Gorse, C., David J., & Pritchard, M. 2012. *Dictionary of Construction, Surveying and Civil Engineering*)

2B. Provide a Romanian translation for the following words:

thread _____; valve _____; fitting _____;
smoothly_____; bend _____; faucet_____;
to grip _____; to slip _____; to scratch_____;
strap _____; wraps _____; clogs _____;

3. Match the pictures with the English equivalent provided on exercise 2A:

Figure 1: Ball valve stem (A) and rotary ball (B)

A. _____; B. _____; C. _____;

D. _____; E. _____; F. _____;

G. _____; H. _____; I. _____;

J. _____; K. _____; L. _____;

4. Translate the Email from Romanian to English. Use the terms acquired during this lesson:

Bună ziua,

Am verificat problema de la chiuvetă și am observat că **sifonul** este crăpat, ceea ce permite mirosurilor neplăcute să iasă. Va trebui să îl înlocuim. De asemenea, conducta de evacuare are o cotitură deteriorată, deci vom avea nevoie de un **cot** nou de 90°.

Pentru a conecta piesele, vom folosi un **niplu** și un **racord în T**, deoarece trebuie să unim trei conducte. Conductele din PVC sunt potrivite pentru această lucrare.

Vom folosi un **clește pentru țevi** și un **cheie pentru robinet** pentru a demonta piesele vechi. Dacă sunt blocaje, voi folosi un **șarpe de scurgere** sau un **șarpe pentru toaletă**, în funcție de locul unde apare problema.

Vă rog să-mi confirmați dacă doriți să continuăm cu reparația.

Cu respect,

Mihai Popescu

Instalator autorizat

5. Reading. Fire Protection in Building Services

A fire needs three main things to keep burning: **fuel**, **heat**, and **oxygen**. If one of these is missing, the fire will go out. **Fire-fighting systems** should match the location of the fire and focus on that area to reduce damage to materials, equipment, and the building. Heat from a fire can damage or set fire to objects far away. To protect structures, **water sprays** can be used on steel to stop it from collapsing.

The type of fire-fighting system used depends on how much **flammable material** is in the building (**fire load**), the kind of **fire risk**, and how involved the people in the building are. When designing **fire escapes** for places with children, the elderly, or people with disabilities, extra care is needed. **Fire-resistant doors** and **walls** must give enough time for these individuals to evacuate safely, as their movement may be slower.

Regular **fire drills** are organized and employees are clearly informed about their roles in emergencies. Staff members are responsible for guiding the public, patients, or students to the meeting point, while some workers may need to use fire-fighting equipment until the **fire brigade** arrives.

(Adapted from https://tinyurl.com/3ef75ky8)

6. Fill-in-the-blanks:

A. A fire needs three main elements to keep burning: fuel, _____, and oxygen.

B. Fire-fighting systems should be matched to the _____ of the fire to reduce damage.

C. Water sprays can be used on _____ to prevent structural collapse.

D. Smoke contains _____ and harmful fumes, which can be deadly when produced from certain chemicals or plastics.

E. Regular fire drills ensure that employees are aware of their _____ during emergencies.

7. Comprehension

1. What happens if one of the three essential elements for a fire is missing?

_____

_____

_____

_____

2. Why should fire-fighting systems focus on the specific location of a fire?

_____

_____

_____

_____

3. What precautions should be taken when designing fire escapes for children, the elderly, or people with disabilities?

_____

_____

_____

_____

4. What types of materials should not be stored near hallways or fire exits?

_____

_____

_____

_____

5. What are the responsibilities of staff members during a fire emergency?

_____

_____

_____

_____

Unit 17: Additional exercises

8. Match the words with their definitions

Simple, hand-operated devices used to stop or control small fires. Employees receive training on how to use them, and the supplies ensure they are gradually checked or maintained.	Fire blankets (Pături ignifuge)
Mainly available in kitchens to cover burning pots of oil or fat or to wrap around people to put out flames on clothing.	Portable extinguishers (Extinctoare portabile)
Used to protect high-fire-risk public and manufacturing buildings. They are placed 3 meters apart, usually on the ceiling, and spray water in a circular pattern.	Fire detectors (Detectoare de incendii)
Devices that sense smoke, often as a sign of fire. They quickly detact smoke and trigger an alarm to warn people, helping them evacuate safely.	Automatic sprinklers (Sprinklere automate)
Contains foaming chemicals that react when mixed or foam driven by CO_2 pressure. They cool the fire, block oxygen, and are suitable for fires involving word paper, textiles, and liquids.	Foam extinguishers (Extinctoare cu spumă)

Key words: Glossary of Terms (UNIT 17)

English	Romanian
Access panel	Panou de acces
Backwater valve	Supapă antirefulare
Ball valve	Robinet cu bilă
Basin Wrench	Cheie pentru robinet/Cheie de chiuvetă
Bend	Cot/Curbă
Check valve	Supapă de sens / Supapă unisens
Clogs	Blocaje/Înfundări
Drain Snake	Șarpe de desfundat
Elbow (pipe fitting)	Cot
Faucet	Robinet/ Baterie (Sanitară)
Fire Drills	Exerciții de evacuare în caz de incendiu
Fire Escapes	Ieșiri de urgență
Fire Load	Sarcină Termică/ Încărcătură de foc
Fitting	Racord/Fitting
Nipple (pipe fitting)	Niplu
Pipe Bender	Dispozitiv de îndoit țevi
Pipe Cutter	Foarfectă pentru țevi de plastic
Pipe Wrench	Cheie pentru țevi/ Cheie stil papagal
P-trap or Pipe Trap	Sifon de scurgere/Sifon în formă de U
PVC Pipe	Țeavă PVC
Septic Tank	Fosă Septică
Smoothly	Lin/Uniform
Strap	Curea/Bandă
Strap Wrench	Cheie cu curea
Tee (Pipe fitting)	Racord în T/ T de legătură
Thread	Filet
To grip	A prinde/ A apuca
To Scratch	A zgâria
To Slip	A aluneca
Toilet snake/ Toilet Auger	Șarpe pentru toaletă/ de WC
Valve	Robinet/Supapă
Vent pipe	Condductă de aerisire/ventilație
Water Sprays	Jeturi de apă/Pulverizatoare

UNIT 18: AN INTRODUCTION INTO ARCHITECTURE

1A. Architectural styles. Read the text and answer the questions:

The design of a building is one of the first things that will capture your attention. If a building is architecturally remarkable, it often becomes a ***landmark*** *that defines a city and is visited by tourists from all over the world. Here are 6 of the most recognised architectural styles that have been applied in many popular structures around the globe.*

Greek and Roman Classical Architecture

This type of architecture refers to the style that was prominently used in ancient Greece and Rome. This architectural style adhered to the concept of building structures utilising a set **template**.

The Greek order of columns, Doric, Ionic and Corinthian, are some of the more identifiable elements of classical architecture. These **guidelines** were followed by Roman architects, with the Corinthian being the more favoured style used in many Roman buildings.

Some of the most popular examples of classical architecture are the Acropolis complex in Athens and the Colosseum in Rome.

Gothic Architecture

Some of the most famous churches in Europe feature the Gothic style of architecture. This architectural type that dominated for hundreds of years began in France and was then adapted throughout the continent. This is a style of **stonework/masonry** building that is characterised by three main features: **sharply pointed arch**, **ribbed** and **vaulted columns**, **and flying buttress**.

Baroque

This style of architecture originated in Italy and was said to be a more emotional and dramatic style designed to appeal to the senses. Baroque architecture usually includes curving forms such as ovals, as well as concave and convex forms that suggest motion. **Distortion** is also another key aspect in this style where you will see figures that are broken, **elongated** or manipulated to make them **stand out.**

Neoclassical Architecture

As the name suggests, Neoclassical architecture is the revival of Classical architecture. The style is very **reminiscent** of the Greek and Roman forms. This resulted in 18th-century buildings somewhat resembling Greek and Roman temples

Neoclassical architecture is defined by clean, elegant lines, **uncluttered** appearance, **free-standing columns** and massive buildings. Some of the more popular examples are the Bank of England Building in Liverpool, the White House in the United States, and the General Post Office in Dublin.

Modern Architecture

This architectural style is an umbrella term that **encompasses** several different styles that became **prominent** during the first half of the 20th century. The modernist style prioritise simplicity of form, **clean structure**, lack of ornamentation, and **function over form**. This style also took advantage of **the advances** in steel, glass and concrete. Some of the best known architects of the 20th century **flourished** during this era including Frank Lloyd Wright and Le Corbusier.

Post-Modern Architecture

As a reaction to the **austerity** and rigidity promoted by Modern architecture, the Post-Modernist architects launched this design movement in the 1960s. The post-modern designs incorporated artistic **austerity** and decorative elements into the building's façade as opposed to just the clean lines **upheld** by modernist styles.

The Post-modernist style **refused to be boxed** to just one type so designs often drew inspiration from a mix of architectural styles. For some buildings, this combination often resulted to a somewhat hybrid and **whimsical** design.

(Text taken and adapted from https://tinyurl.com/ydjzv3ch)

1B. Vocabulary. Translate the words in **bold** found in the definitions provided above.

template _____; guidelines _____;

stonework/masonry _____; pointed arch _____;

ribbed columns _____; vaulted columns _____;

flying buttress _____; distortion _____;

elongated _____; to stand out _____;

(to be) reminiscent _____; uncluttered _____;

free-standing columns _____; to encompass_____;

prominent _____; clean structure _____;

function over form _____; advances _____;

austerity _____; to flourish _____;

ornamentation _____;

2. **Classroom discussion:** What is your favorite architectural style? Justify your answer and provide an example.

3. **Listening exercise 🎧:** Watch the video and answer the following questions:

URL: https://tinyurl.com/3r9dndjs

A. What will be the height of the tallest construction in Barcelona?

B. What is the main problem with building the towers of the Sagrada Familia?

C. Where does the stone used for the Sagrada Familia come from?

_____

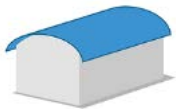
D. What is the height, width and weight of the wall pieces used to build the towers of the Sagrada Familia?

_____

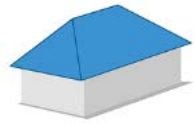
E. How long did Antonio Gaudi work on the Sagrada Familia?

_____

4. Look at the pictures. Provide the English equivalent for the following roof types.

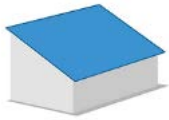


A. Acoperiș boltit



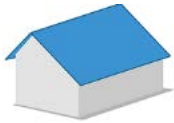
B. Acoperiș în 4 ape (cu coamă)

C. Acoperiș în 2 ape



D. Acoperiș într-o apă

E. Acoperiș plat



F. Acoperiș în 2 ape nesimterice

G. Acoperiș cu falsă mansardare/tip baroc

(Text taken and adapted from https://tinyurl.com/mw7pznnk)

A. _____; B. _____;

C. _____; D. _____;

E. _____; F. _____;

G. _____;

5A. **The constitutive elements of a roof**. Look at the picture. Read the terms carefully and match them with a definition.

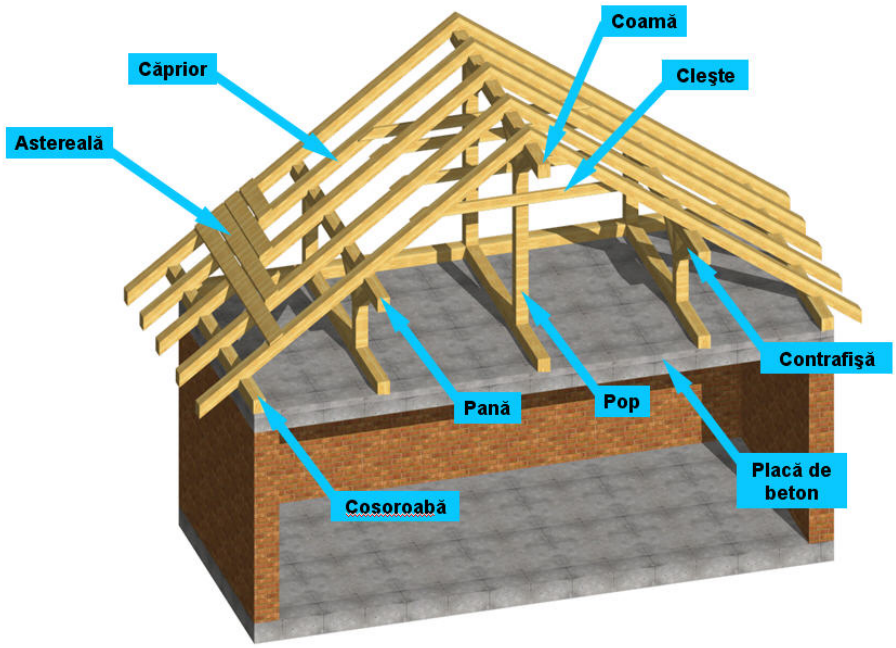


Figure 5: The constitutive elements of a roof. Taken from https://tinyurl.com/yv5x8yrc

A. Reprezinta o grinda de lemn asezata perimetral peste peretii casei spre exterior. Rafalele de vant, tornadele care au inceput sa apara si la noi cu intensitati din ce in ce mai mari sunt factorii principali ce cauzeaza smulgerea acoperisului. Rezistenta intregii structuri a acoperisului depinde de sistemul de ancorare al grinzilor pe _____.

B. Învelișul din scândură al acoperișului. De obicei _____este realizată din scânduri de brad sau alte esențe moi cu grosime de 2-2,5 cm.

C. Element compus din două scânduri de lungimi identice care se fixează de o paerte și de alta a unui ansamblu de grinzi din lemn cu scopul de a mări stabilitatea acestui ansamblu.

_____.

D. O grindă intermediară din lemn dispusă orizontal se numește _____.

E. Bară de lemn sau de metal folosită pentru transmiterea forțelor de la o piesă orizontală la una verticală. _____.

F. Un stâlp vertical folosit în proiecte arhitecturale sau poduri, folosit în special ca element de suținere pentru grinzi.

_____

G. Element de construcție (din lemn, beton armat, oțel), având lungimea mai mare în raport cu celalalte dimensiuni, care, pus la o construcție, servește drept piesă de rezistență.
_____.

H. Linie de intersecție, orizontală sau oblică, a două versante de acoperiș. Muchia superioară a unui acoperiș rezultată din îmbinarea a două pante. _____.

I. Grindă de lemn orientată spre direcția de scurgere a apelor care susține suportul învelitorii acoperișului.

_____.

(Text taken and adapted from https://tinyurl.com/42hjuxkp)

5B. Write down the keywords from the previous exercise:

1. Caprior _____;

2. Coamă _____;

3. Placă de beton _____;

4. Grindă de susținere _____;

5. Pop _____;

6. Contrafisă _____;

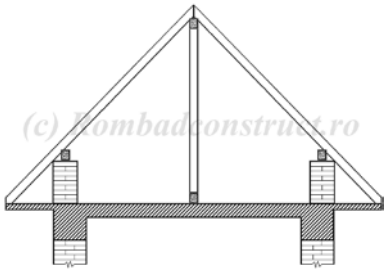
7. Pană de coamă _____;

8. Cleşte _____;

9. Astereala _____;

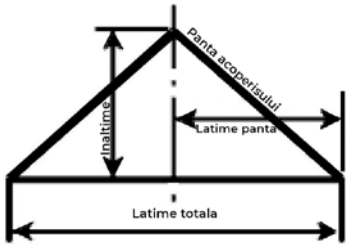
10. Cosoroabă _____;

6A. The exterior of the roof. Provide an English translation for the following terms:



Șarpantă: Șarpanta din lemn este cea mai des întâlnită la construcțiile de locuințe sau la clădirile care nu au o deschidere mare a acoperișului, aceasta fiind și cea mai ieftină variantă.Șarpanta din lemn este alcătuită din popi, cosoroabe, pene și căpriori.

Versant – fiecare dintre suprafețele înclinate ale unui acoperiș. Se mai numește și **apă.** Reprezintă unul dintre elementele de identificare și clasificare a acoperișurilor.



Panta acoperișului - reprezintă unghiul de inclinare al versantului. Este un element foarte important al acoperisului deoarece valoarea ei influenteaza tipul de material folosit pentru invelitoare sau, invers, tipul de material folosit determina unghiul de inclinare al versantului. In general panta versantului (acoperisului) se masoara in grade.

Jgheab – element constitutiv al sistemului pluvial. Poate fi semirotund sau rectangular și are rolul de a colecta apele pluviale de pe versanții acoperișului.

Burlan - element constitutiv al sistemului pluvial. Poate avea secțiunea rotundă sau rectangulară și are rolul de a evacua apa colectată de jgheaburi.

Dolia- Rolul său este de a uni două ape ale acoperişului şi de a izola intersecţia acestora. Totodată, dolia contribuie la colectarea apei de pe acoperiş şi la evacuarea sa spre jgheaburile sistemului pluvial.

Cornișă – partea superioară, ieşită în afară şi ornamentată, a zidului unei construcţii, având rolul de a sprijini acoperişul şi de a împiedica scurgerea apei de ploaie pe faţa clădirilor.

Parazăpadă – element montat la marginea streşinii unei clădiri sau pe învelitoare pentru a împiedica căderea zăpezii de pe acoperiş.

Învelitoare- Stratul de finisare si protectie al unui acoperis cu panta.

(Text taken and adapted from https://tinyurl.com/42hjuxkp)

6B. Keywords. Provide a Romanian translation for the following words:

Șarpantă _____; Panta acoperișului_____;

Jheab _____;Burlan _____;

Parazapadă _____; Cornișă _____;

Dolie _____; Versant _____;

Învelitoarea acoperișului _____;

Unit 18: Additional exercises

7. **Communication in Architecture: Role-play and Dialogue Practice.** Work in pair or small groups. One person plays the architect, and the other plays the client, city planner, or construction manager. Use the vocabulary from Unit 5 and try to include at least 5 technical terms in your conversation.

Architect- Client Meeeting

- The client wants to build a modern house with minimalist design and sustainable materials.
- Discuss architectural style, roof type, and materials.
- Example phrases: “We recommend a flat roof for a clean structure…” / “This style emphasizes function over form…”

Key words: Glossary of Terms (UNIT 18)

English	Romanian
austerity	asprime/severitate
collar beam	cleşte
concrete slab	placă de beton
cornice/ledge	cornişă
curved roof	acoperiş boltit
drainpipe	burlan
elongated	alungit
flat roof	acoperiş plat
flying butress	contrafort suspendat
free-standing columns	coloane libere
function over form	functionalitate în detrimentul formei
guidelines	instrucţiuni
gutter	jgheab
hip/hipped roof	acoperiş în 4 ape/ cu coamă
king post	pop
landmark	punct de reper
mansard roof	acoperiş cu falsă mansardare/tip baroc
masonry	zidărie
pointed arches	arcade ascuţite
purlin roof	pană de coamă
rafter	căprior
ribbed columns	coloane nervurate
ridge board	coamă
roof covering	învelitoarea acoperişului
roof decking	astereală
roof framing/roof structure	şarpantă
roof slope	panta acoperişului
saltbox roof	acoperiş în 2 ape (nesimetrice)
skillion roof	acoperiş într-o apă
snow guards	parazăpezi
strut	contrafişă
template	şablon predefinit
the slopes of the roof	versant
the valley of the roof	dolie
tie beam/ceiling joist	grindă de susţinere

English	Romanian
to encompass	a cuprinde
top plates	cosoroabă
two-ridged roof/gable roof	acoperiș în 2 ape
vaulted columns	coloane boltite
whimsical	fantezist

UNIT 19: REVISION - PART I

1A. Communication. Match photos A-E to Texts 1-5.

1. Hello, I'm Bruce Wayne, from the United States of America. I'm a plumber……

2. I'm Gal Gadot, from Israel. I'm an architect……

3. Hi, my name is John Smith. I'm from Australia. I'm a crane operator……

4. Hi, I'm Robert Lewandowski. I'm from Poland. I'm a roofer……

5. Hello there. My name's Antonio Margheriti. I'm from Italy. I'm a construction manager…….

A._____; B._____;

A._____; B._____; C._____;

1B. Communication.Complete these conversations

1. Antonio: Hi! I'm Antonio Margheriti, from Design Construct company.

Gal: Hi, Mr Margheriti. (1)_____ Gal Gadot. I'm from (2) _____. I'm the architect of the project.

Antonio: Ah, I'm a construction (3) _____.

Gal: Pleased to (4)_____ you.

2. Robert: Hi! Robert Lewandowski.

John: John Smith.

Robert: What do you do, John?

John: I'm a _____ _____. And you?

Robert: Me? I'm a _____.

3. Bruce: Hi! My (7) _____ is Bruce Wayne.

John: Hi, Bruce. I'm John Smith.

Bruce: (8)_____ are you from?

John: I'm from Perth, Australia.

4. Emma: Hello! I'm Emma Thompson, _____ _____ at Bright Ideas Ltd.

Daniel: Hi, Emma. Nice to _____ you. I'm Daniel Craig.

Emma: Nice to meet you too, Daniel. What do you _____?

Daniel: I'm a _____ _____. I work _____.

Emma: Oh, great! Do you _____ in London?

Daniel: No, I live in _____, but I often _____ for work.

Emma: That's exciting. I'm _____ in London full-time

2. Oral Communication: Using the template below, students have 5 minutes to write short, personal answers to each question. One by one, students have to come in front of the classroom and deliver a 1-2 minute presentation. After each presentation, classmates may ask one follow-up questions (e.g. “What kind of music do you like”, or “Why did you choose this university?”).

1. My name’s ….

2. I am a/an…..

3. I live in ……

4. I come from……

5. In my free time, I like to……

6. I am a second year student at the …….

3. Vocabulary. Write five examples of the following:

1. Jobs in the construction industry

_____
_____
_____
_____

2. Types of constructions:

_____
_____
_____
_____

3. Parts of a house

_____
_____
_____
_____
_____

4. Vocabulary. Fun with abbreviations. What do the following letters mean?

1. HVAC

_____

2. AC

_____

3. PPE

_____

4. HV

_____

5. kg

_____

6. CM

_____

7. RPM

_____

5. Vocabulary. Complete these sentences. Write one word in each gap.

1. I'm a bricklayer. I lay _____.

2. I'm a _____. I do the walling and the plastering.

3. I'm a _____. I do the heating, ventilation, and air conditioning.

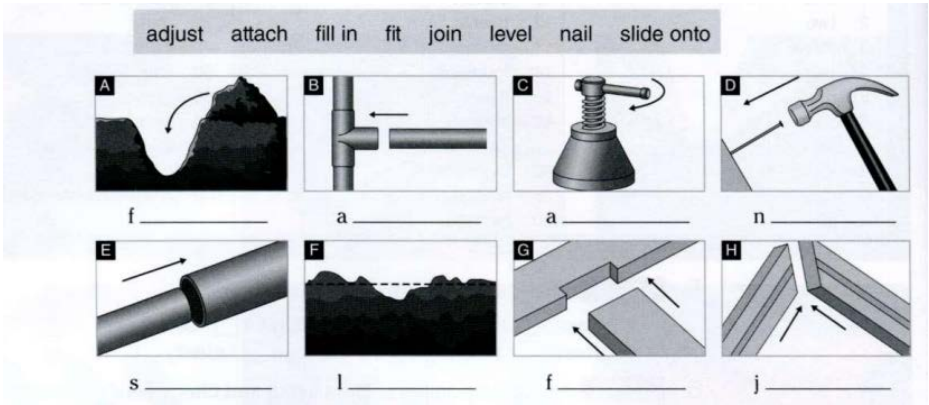
4. I'm a carpenter. I work with _____.

5. I'm a _____. I install windows.

6. I'm a painter. I use _____ to decorate houses.

7. I'm a welder. I weld _____.

6. Match diagrams A-H to the verbs in the box



(taken from Frendo, Evan (2012) English for Construction, London: Pearson, p. 16)

1. Adjust _____. 2. Attach _____.3. Fill in _____.

4. Join _____.5. Level _____.6. Nail _____.

7. Slide onto _____.8. Fit _____.

Unit 19: Additional exercises

7. Group assignment. Work in pairs of three. Look at the list below. Link each job with the processes and tools needed for that particular profession. Add other tools and processes from your own vocabulary.

Jobs: construction worker, surveyor, tile setter, mason, concrete finisher, ironworker, crane operator, plumber, carpenter, painter, construction manager, welder, forklift operator.

Processes: surveying, digging/excavating, trenching, leveling, compaction, foundation pouring, walling, plastering, setting/laying tile, installation of metal structures, concrete pouring, woodworking, insulation, roofing.

Tools: trowel, wheelbarrow, angle grinder, sledgehammer, circular saw, pickaxe, level, welding machine, flashlight, shovel, paint brush, bucket, nail gun, tape measure.

Jobs	Processes	Tools
Construction worker		
Surveyor		
Tile setter		
Mason		
Concrete finisher		
Ironworker		
Crane operator		

Plumber		
Carpenter		
Painter		
Construction manager		
Welder		
Forklift operator		

Key words: Glossary of Terms (UNIT 19)

English	Romanian
Adjust	A ajusta/ A regal
Attach	A atașa
Fill in	A umple/ A completa
Join	A îmbina/A uni
Level	A nivela
Nail	A bate cuie
Slide onto	A aluneca/A introduce prin glisare
Fit	A potrivi
Surveying	Măsurători topografice
Trenching	Săparea de șanțuri
Compaction	Compactare
Foundation pouring	Turnarea fundației
Walling	Zidărie
Plastering	Tencuire
Trowel	Mistrie
Wheelbarrow	Roabă
Pickaxe	Târnăcop

UNIT 20: REVISION – PART II

IA. Communication: Guess the tool

Each student will receive a piece of paper or a card with the name of a construction tool (Example: pliers, wrench, hacksaw). Students will work in pairs of two. One of the students will describe the function of the tool while the other student will guess the tool.

IIB. If you are studying from home, complete the following task. Below you will find a list of construction tools. For each tool, write one or two sentences describing its functions or typical use on a construction site.

Example:
A level is an intrument designed to indicate whether a surface is horizontal or vertical.

1. Hammer

_____
_____
_____
_____

2. Screwdriver

_____
_____
_____
_____

3. Pliers

_____
_____
_____
_____

4. Chainsaw

_____
_____
_____
_____

5. Caulking Gun

6. Wrench

7. Wheelbarrow

8. Bolt

9. Welding torch

10. Drill

2. Writing: Identifying the resources needed on a construction site.

Look at the pictures below. For each picture, make a list that includes: 5 construction tools (e.g. trowel, level), 5 building processes (e.g. walling, plastering), 5 construction machines (e.g. crane, bulldozer), and 5 professsions (e.g. painter, glazier).

(Taken from https://tinyurl.com/2tphbese)

TOOLS	MACHINES	PROCESSES	PROFESSIONALS

(Taken from https://tinyurl.com/t7dxk8dn)

TOOLS	MACHINES	PROCESSES	PROFESSIONALS

(Taken from https://tinyurl.com/yc82w8jb)

TOOLS	MACHINES	PROCESSES	PROFESSIONALS

(Taken from https://tinyurl.com/55exptny)

TOOLS	MACHINES	PROCESSES	PROFESSIONALS

3. Writing emails in a professional environment.

A. Complete the text with the missing technical terms.

Dear Supplier,

We would like to order the following materials for our project:

- 50 cubic meters of _____ for the foundation.
- 200 _____ for the roof structure.
- 500 _____ for the external walls.
- 100 sheets of _____ for thermal insulation.
- 300 square meters of _____ for flooring.
- 150 meters of _____ piping for water supply.
- 50 liters of _____ for painting the interior walls.
- 20 tons of _____ for reinforcing concrete beams.
- 80 square meters of _____ for window glazing.
- 40 bags of _____ for plastering.

Please confirm delivery to the _____ by Friday.

Best regards,
John Smith
Site Manager

B. You are a site engineer. Write an email to your manager explaining a delay because the concrete delivery is not available. Suggest a solution and ask for approval.

C. Pair activity:

Student A: Write an email requesting PPE for workers.

Student B: Reply confirming availability and delivery date.

EMAIL 1

EMAIL 2

4. Write a short description (8-10 sentences) of your ideal job in the construction industry. Include the job title, describe te main responbilities of this job, mention the tools, machines, or materials you would use, explain why this job in important for construction projects. Add one or two sentences about why you would enjoy this job.

INTERRACTIVE ACTIVITIES

A. SOFT BALLS

- It's an activity to review topics.
- Students make a big circle.
- The teacher throws the ball saying a topic; the student who catches the ball has to say a word that belongs to this topic and throw the ball again.

B. SIMON SAYS

- The teacher gives an order by saying "Simon says touch your head".
- Students have to imitate the order only if the order is told after "Simon says".
- If not, they have to rest without doing anything. If students do the action, they are out.
- The last child left in the game becomes the new caller.

C. SPELLING RACE

- The teacher dictates a word letter by letter.
- Pupils have to guess the word before the teacher had told all the letters of the word.
- For example: E-L-E-P… ("Elephant!")

D. LETTER JUMBLE

- The class is divided into pairs or groups.
- The teacher writes some words about a topic on the blackboard and gives each group a set of small cards were students write each letter of the words written on the blackboard.
- Then they have to mix the letters and then recompose each word. The teacher walks around checking the words and asking the students to read out the words.

E. THE REVISION BOX

- The teacher uses a vocabulary box. This box must mainly comprise of words on pieces of paper (either verbs, adjectives, adverbs, etc.) all said by the learners themselves in previous lessons.
- The box with all the words is circulated around the class. Each learner is given a chance to pick a word from which he/she will have to construct a short and grammatical sentence.
- Each sentence said is written on the board just as the speaker said it. After 12 to 20 sentences, the sentences are analysed to see if they are grammatically correct with the emphasis placed mainly on the word from the vocabulary box.

F. THE TONGUE TWISTER GAME

- This activity can be used to practice the pronunciation of difficult sounds.
- The teacher writes some English tongue twisters on the board or on pieces of paper to distribute to students. The teacher asks them to read the tongue twisters aloud.
- Then faster. Then three times in a row.
- Here are some examples: “She sells sea shells on the sea shore”; “A proper copper coffee pot”.

G. THE ‘ACTIVITY’ GAME

- The students will be asked to work in groups of 5.
- Each student will be asked to come in front of the classroom. He/she will receive a sheet of paper from the teacher containing vocabulary words from the previous units.
- The student will have 1 minute to (1) define the word, (2) mime it, or (3) draw it. His/her team members will get two points if they can guess the word.
- During this time, the other teams can try and guess the word and write it on a piece of paper before the time is up. If they have guessed correctly, the team will receive 1 point.
- The team with the most points will be declared winner.

ANSWER KEY

UNIT 1: AN INTRODUCTION INTO CIVIL ENGINEERING

Exercise 3

A-3; **B**-1; **C**-7; **D**-4; **E**-2; **F**-8; **G**-5; **H**-6;

Exercise 4

A- irrigation (irrigation systems) – irigații (sisteme de irigații); **B-** aiport (aeroporturi); **C**-road (drum); **D-** railway lines (căi ferate); **E**- harbor (port); **F**- bridge (pod); **G-** aqueduct (apeduct); **H-** dam (baraj); **I**- sewer (canalizare); **J**- canal (canal).

Exercise 5

A. Translation model

Termenul "inginerie civilă" descrie lucrările de inginerie efectuate de civili. În general, acesta descrie profesia de proiectare și executare a lucrărilor structurale pentru publicul larg.

B. Translation model

Ingineria civilă acoperă diverse domenii ale ingineriei, inclusiv proiectarea și construcția de clădiri de mari dimensiuni, drumuri, poduri, linii de cale ferată, canale, aeroporturi, sisteme de alimentare cu apă, baraje, irigații, porturi, docuri, apeducte și tuneluri.

C. Translation model

Inginerul civil are nevoie de cunoștințe temeinice de topografie, de proprietățile și mecanica materialelor de construcție, de mecanica structurilor și solurilor și de hidraulica și mecanica fluidelor. În zilele noastre, ingineria civilă include producția și distribuția de energie, dezvoltarea aeronavelor și a aeroporturilor, construcția de fabrici de procesare chimică, centrale nucleare și stații de epurare.

Exercise 6A

Total length of the Bridge	2734 m
Width of the bridge	27,4 m
Height of the bridge	227,4 m
Main material used for manufacturing the bridge	steel (oțel)
Number of vehicles crossing the bridge (on a daily basis)	118,000 cars
Total weight of the Bridge	887, 000 tons

Exericse 7

A. Translation model

*The largest tomato in the world was grown in the United States of America. It had a **circumference** of 83.8 cm and a **weight** of 4.896 kg.*

B. Translation model

*Located in the western Pacific Ocean, the Mariana Trench has a **depth** of 10,984 meters.*

C. Translation model

*The highest mountain in our solar system is on planet Mars. Olympus Mons has a total **height** of 24 km, about **3 times higher** than Mount Everest.*

D. Translation model

*The largest pizza calzone **weighed** 31.4 kg and was made in the city of West Lafayette in the United States of America. It was 2.84 m **long** and 55.88 cm **wide**.*

UNIT 2: JOBS AND PROCESSES IN CONSTRUCTION

Exercise 1

construction worker – muncitor (în construcții); **surveyor**- topograf; **tile setter**- faianțar (montator gresie, faianță, țiglă- în lb. Engleză 'tile'); **mason**- zidar; **concrete finisher**- finisor de beton; **ironworker**- montator structuri metalice; **crane operator**- operator de macara/ macaragiu; **plumber**- instalator;

carpenter- dulgher; **painter**- zugrav; **construction manager**- diriginte/șef de șantier; **welder**- sudor; **forklift operator**- operator stivuitor; **electrician**- electrician;

Exercise 3

Down

1. A person who applies paint during different construction projects. - painter

2. A person whose job is to connect, repair, etc. electrical equipment. - electrician

6. A person who operates a crane (a big machine with a long arm that is used by builders for lifting and moving heavy things) - 2 words - crane operator

7. A person whose main job is to operate a forklift (a self-propelled machine for hoisting and transporting objects by means of steel fingers inserted under the load) - 2 words - forklift operator

8. A skilled person who works with concrete by placing, finishing, protecting and repairing concrete in engineering and construction projects – 2 words - concrete finisher

Across

3. A person whose job is making and repairing wooden objects and structures. - carpenter

4. A person who builds using stone, or works with stone. - mason

5. A person who installs tiles to floors, walls, or ceilings – 2 words - tile setter

9. Overseeing the planning, design and construction of a project, from its beginning to its end – 2 words - construction manager

10. A person whose job is to fit and repair things such as water pipes, toilets, etc. - plumber

11. A person who works in the iron-working industry. He/she assembles the structural framework in accordance with engineered drawings and installs the metal support pieces for new buildings. - ironworker

12. A person who works in the construction industry, especially one engaged in manual work. - construction worker

13. A person whose job is welding metal. - welder

14. A person whose job is to examine and record the details of a piece of land. - surveyor

Exercise 4A

career; appealing; nowadays; responsible; high-pressure; leadership; install; streams; certified; in addition; hands-on; there; steel; quite; jobsite; office;

Exercise 4B

to oversee- a supraveghea**; water supply lines**- linii/sisteme de alimentare cu apă; **long-term**- pe termen lung**; waste disposal systems**- sisteme de eliminare a deșeurilor; **appliances**- aparate; **fixtures**- corpuri**; income**- venit; **iron**- fier**; to fulfill**- a împlini; **apprenticeship** – ucenicie/ perioadă de probă.

Exercise 6

1. surveying – topografiere; **2. digging/excavation** – excavare; **3. trenching** – tranșare; **4. leveling** – nivelare; **5. compaction** – compactare; **6. foundation pouring** – turnare de fundație; **7. walling** – zidărie; **8. plastering** – tencuială (acțiunea de a tencui); **9. setting/laying tile** – montare de gresie, faianță, țiglă; **10. installation of metal structures** – instalarea structurilor de metal; **11. concrete pouring** – turnare de beton; **11. woodworking** – prelucrarea lemnului; **12. insulation** – izolații; **13. roofing** – lucrări la acoperiș (de construcție sau de reparații);

UNIT 3: CONSTRUCTION TOOLS

Exercise 2

1. trusă de scule; **2**. foarfecă; **3**.ciocan; **4**. ciocan cu gheară; **5**. ciocan din plastic sau din cauciuc; **6**. cui; **7**. topor; **8**. lanternă; **9**. șurubelniță; **10**. piuliță; **11**. clește; **12**. nivelă; **13**. ruletă; **14**. rangă; **15**. fierăstrău; **16**. fierăstrău circular; **17**. drujbă; **18**. bormașină; **19**. pistol de ștemuire/ pistol de silicon; **20**. cheie; **21**. bandă adezivă;

Exercise 4

A. axe (topor); **B.** circular saw (fierăstrău circular); **C.** mallet (ciocan din lemn sau din cauciuc); **D.** level (nivelă, nivelmetru, boloboc); **E.** drill (bormașină); **F.** handsaw (fierăstrău); **G.** crowbar (rangă); **H.** file (pilă); **I.** pliers (clește); **J.** wrench (cheie).

Exercise 5

A. Translation model:

Instrumentele/uneltele manuale și electrice fac parte din viața noastră de zi cu zi și ne ajută să îndeplinim cu ușurință sarcini care altfel ar fi dificile sau imposibile. Cu toate acestea, instrumentele simple pot fi periculoase și pot provoca leziuni grave atunci când sunt utilizate sau întreținute necorespunzător.

B. Translation model:

La un moment dat, majoritatea oamenilor vor folosi până și cele mai rudimentale unelte de mână – de la montarea unui tablou (sau a unei poze), la instalarea de rafturi, cei mai mulți dintre noi vor avea nevoie de un set unelte esențiale în propria locuință. Dar până si cel mai experimentat profesionist ar putea avea intrebari despre anumite unelte sau ar putea fi în cautarea unei colectii de unelte imprios necesare pentru trusa de scule. De ce ai nevoie?

C. Translation model:

Diferite tipuri de unelte manuale includ șurubelnițe, ciocane, clești și chei. În funcție de nevoile tale, fiecare dintre acestea se utilizează în scopuri diferite, multe dintre ele îndeplinind un scop specific. A ști ce sunt uneltele de mână și care este utilitatea lor este important pentru oricine dorește să construiască sau să repare aproape orice.

Exercise 6

a. **to carry out -** a realiza; a efectua; Ex: *The workers **carried out** the construction work on 215 Drumești Street.*

b. **to run (it) by someone** – a cere părerea (sfatul professional/acordul) cuiva; Ex: *I'm not sure if this project is legal. I have **to run it by** our lawyer.*

c. **to take on something** – a începe/ inița ceva; Ex: *As an architect, I will **take on this project** and in addition to my current workload.*

d. **to call off something** - to cancel – a anula ceva; Ex: After that night, she **called off** the wedding.

e. to pull down something - to demolish- a dărâma ceva; Ex: *He **pulled down** the main wall of the building.*

f. **to fence off something** - a împrejmui (un obiectiv) cu gard; Ex: *The construction site must be **fenced off.***

h. **to draw up something** - a schița/ a desena ceva; Ex: *I will **draw up** the schematics of the building.*

UNIT 4: TYPES OF BUILDINGS AND STRUCTURAL COMPONENTS

Exercise 1

A. residential building/ apartment block; **B**. skyscraper/ office building; **C.** power plant/ industrial building; **D.** warehouse/ storage building; **E.** stadium/ assembly building; **F.** hospital/institutional building; **G.** mall/ commercial or mercantile building; **H.** museum/ assembly building;

Exercise 2

A – 8; B – 7; C – 4 D – 3; E – 5 F – 2; G – 9; H – 1; I – 6;

Exercise 3A

1. loc/spațiu de dormit; **2.** spații de cazare/ locuințe; **3.** grădinițe/creșe; **4.** birouri; **5.** tribunale; **6.** biblioteci; **7.** bunuri; **8.** piețe; **9.** materie primă; **10.** uzine de asamblare; **11.** instalații/uzine de curățare chimică; **12.** centrale electrice; **13.** adăpostire; **14.** depozite; **15.** grajduri; **16.** hangare; **17.** garaje; **18.** nociv/periculos.

Exercise 4

A. buildings, roads, railways, bridges, dams, water-supply systems, sewerage; power lines.

B. civil buildings, administrative/commercial buildings, industrial buildings, agro-zootechnical buildings.

C. the foundation of the building, the body of the building, the roof of the building.

D. walls and floors, partitions, stairs.

UNIT 5: BUILDING MATERIALS AND MEASUREMENTS IN CIVIL ENGINEERING

Exercise 1A

cărămizi – bricks; piatră – stone; calcar – limestone; ciment – cement; cherestea – timber; nisip – sand; mortar – mortar; beton – concrete; aluminiu – aluminum;

cupru – copper; sticlă – glass; vopsele – paints; adezivi – adhesives; bitum - bitumen; plastic – plastic; beton armat – reinforced concrete; material izolator – insulator; polistiren- polystyrene; argilă – clay; oțel – steel;

Exercise 2

A – 4; B – 7; C – 8; D – 9; E – 2; F – 3; G – 5; H – 6; I – 1;

Exercise 3

a) cement: cubic meters; b) sand: kilograms, tons; c) polystyrene: square meters; square feet; d) varnishes: liters; e) steel: kilograms, meters, square meters;

Exercise 4

Translation model:

Subject: Purchase/acquisition list of building materials

Good day,

Please supply the materials found on the list below, needed to start construction work on a building located on Mihăileni Street, no. 228/ 228 Mihăileni Street.

- *10 bags of mortar (25 kg);*
- *100 liters of paint (interior-exterior), color: white;*
- *250 wooden planks (200 x 40 x 20 mm);*
- *360 bricks (375 x 250 x 238 mm);*
- *10 liters of universal paint thinner;*
- *15 liters of varnish (for wood protection);*
- *30 square meters of square tile (60 x 60 cm); color brown;*
- *20 square meters of polystyrene (1000 x 500 x 50 mm);*
- *a ton of rectangular steel bars (6000 x 50 x 50 mm);*

Kind regards,

Ing. Sava Alexandru

Exercise 5A

1. wood, animal pelts, stone; **2.** the Pantheon in Rome, Italy. **3.** I.M. Pei **4.** five million bolts **5.** Burj Khalifa in Dubai (828 meters)

Exercise 5B

1. stone; **2.** glass; **3.** reinforced concrete;

Exercise 7

A. Translation model:

Materialul de construcție reprezintă orice material care poate fi folosit pentru construcții. De obicei, acesta include lemn, beton, oțel, ciment, agregate, cărămizi, lut, metal și multe altele. În trecut/pe vremuri, oamenii foloseau cărămizi, lemn sau paie. Dar în această epocă/eră modernă, inginerii au învățat să amestece și să potrivească materialele ideale pentru a produce structuri de calitate superioară. Desigur, alegerea se bazează întotdeauna pe bugetul clientului și pe eficiența materialelor în proiectele de construcție.

B. Translation model:

Materialele de construcție pot fi clasificate și catalogate în funcție de proprietățile lor, utilizare, preț, eficacitate și fiabilitate. Folosit de câteva secole, lemnul, varul, cărămizile și pietrele pot fi considerate materiale de construcție tradiționale. Metalele feroase, cum ar fi oțelul și fierul, precum și aliajele ca aluminiul sunt adesea folosite pentru a construi atât clădiri comerciale, cât și rezidențiale.

C. Translation model:

Alte materiale folosite pentru construcții sunt obținute printr-un amestec de nisip, ciment, var, noroi și apă și sunt cunoscute sub numele de mortare. Betonul este, de asemenea, un material de construcție principal și este produs într-o varietate de compoziții, finisaje și caracteristici de performanță pentru a satisface o gamă largă de nevoi.

D. Translation model:

În zilele noastre, sticla, vopselele, lacurile, materialele plastice, izolatorii și adezivii sunt adesea folosite pentru a complementa materialele tradiționale de construcție cu scopul de a crea structuri rentabile, moderne și practice.

UNIT 6: PROPERTIES OF BUILDING MATERIALS

Exercise 2

rezistență la rupere – breaking strenght; rezistență la curgere – flow resistance; elasticitate – elasticity; duritate – hardness; rigiditate – rigidity; tenacitate – tenacity/resilience; rezistență la oboseală – fatigue; rezistență la compresiune – compression.

Exercise 4

A. hardness (duritate); **B**. elasticity (elasticitate); **C**. fatigue (rezistență la oboseală); **D**. compression (compresiune); **E**. tenacity (tenacitate);

Exercise 5

A. Translation model

Proprietățile mecanice ale unui material sunt definite ca acele proprietăți care influențează reacția materialului la sarcinile aplicate. Proprietățile mecanice sunt folosite pentru a determina cum s-ar comporta un material atunci cand este supus diferitelor tipuri de tensiuni.

B. Translation model

Măsura cantității medii de forță exercitată asupra unui material de construcție este cunoscută sub denumirea de tensiune. Aceasta arată intensitatea forțelor interne totale care acționează în interiorul unui corp ca reacție la forțele externe aplicate și la forțele corpului. Forța sau greutatea aplicată unei structuri este cunoscută drept sarcină/încărcătură.

C. Translation model

Proprietățile materialelor de construcții pot fi clasificate ca proprietăți fizice, chimice și mecanice. Proprietățile fizice se referă la proprietăți precum dimensiunea, starea de agregare a unei materii (solid, gaz sau lichid), densitatea, masa, rezistența sau culoarea, în timp ce proprietățile mecanice se referă la modul în care un material reacționează atunci când este supus unor forțe.

D. Translation model

În calitate de inginer, este important să aveți cunoștințe despre proprietățile chimice ale materialelor de inginerie deoarece majoritatea materialelor de inginerie intră în contact cu alte materiale și se produc reacții chimice între aceastea. Datorită acestor reacții, materialele pot suferi de pe urma deteriorării chimice.

Exercise 6

1. durability (durabilitate); **2.** frost resistance (rezistență la îngheț); **3.** weathering resistance (rezistență la factori de mediu); **4.** water absorption (absorbție de apă); **5.** heat conductivity (conductivitate termică).

Exercise 6A

1. to emphasize – a sublinia, a accentua; **2**. stone axe – topor de piatră; **3.** alloy – aliaj; **4**. copper – cupru; **5**. lead – plumb; **6.** cast materials – material turnate; **7**. iron – fier; **8**. to usher in – a inaugura/ a introduce; **9.** automotive – automotivă; **10**. to take something for granted – să iei un lucru de bun; **11**. goods and services – bunuri și servicii.

Exercise 7B

A. True; **B**. False: **C**. True; **D**. True.

UNIT 7: THE CONSTRUCTION SITE

Exercise 1B

A. north (direction); **B.** plot; **C.** built-up area; **D.** approach road; **E.** XYZ supermarket; **F.** water line; **G.** sewage line; **E.** electricity line

Exercise 1C

A. parcelă de teren; **B.** drum (principal) de acces; **C.** suprafața construită/zona de construcție; **D.** spații deschise; **E.** linie de alimentare cu apă; **F.** sistem de canalizare; **G.** linie electrică;

Exercise 2

birouri; spații de cazare; zonă de depozitare; garduri; structura de organizare/ proiectarea șantierului; cască de protecție; izolat; trusă de prim ajutor; extinctor; cale de evacuare; sală de mese/cantină; contractant; zone de stocare/depozitare (pentru materiale și utilaje); depozite; resturi/rămășițe; stație de beton; siloz; stive de agregate; tâmplărie.

Exercise 3A

A. The use of personal protective equipment such as hard hats, safety shoes, goggles or gloves; access to equipment and services (first aid kits, well-equipped medical rooms with doctors and nurses); fire extinguishers.

B. Most construction sites are fenced and protected by guards.

C. Storage areas are used to avoid unwanted material handling. They allow you to store goods such as building materials as well as tools and machines needed for the project.

D. accomodation spaces, messrooms, toilet facilities, craft change- houses, offices.

E. This minimizes the changes of accidents, increases the morale of drivers and cuts the time needed to leave and arrive on the construction site.

F. Batch plants are provided on projects where it is more economical to produce concrete on site than to buy a ready mix.

Exercise 4

1. stone warehouse; **2.** carpentry**; 3.** steel warehouse; **4.** debris; **5.** water & power; **6.** house foundation; **7.** offices; **8.** access road; **9.** toilets;

Exercise 5

A. house foundation; **B.** access road; **C.**offices; **D.** carpentry; **E.** toilets; **D.** water & power; **G.** debris; **H.** stone warehouse; **I.** steel warehouse.

Exercise 6

1. challenging; **2.** resources; **3.** tasks; **4.** schedule; **5.** critical; **6.** planning; **7.** organizational; **8.** finely-tuned; **9.** flawless; **10.** primary.

Exercise 7

A. Translation model

Un șantier poate fi definit ca o zonă sau o porțiune de teren pe care se execută lucări de construcție. Există diferite tipuri de șantiere. Acestea pot fi clasificate în funcție de tipurile de clădiri construite, utilitatea și scopul acestora. Dintre aceste categorii, putem aminti ***locuințe*** *sau* ***construcții rezidențiale***, ***stații/uzine de gestionare a deșeurilor***, ***infrastructură pentru trafic și transport****, clădiri destinate producerii de energie,* ***uzine de gaz și petrol****.*

B. Translation model

Locuințele și clădirile rezidențiale au propriul set de legislație în majoritatea țărilor. Șantierele de construcție pentru locuințe includ ***case***, ***apartamente*** *și* ***apartamente mici*** *(de tip studio). Facilitățile precum piscină, teatru, parcuri din interiorul unui complex de apartamente fac, de asemenea, parte din șantier. Șantierul de construcție a* ***conductelor de gaz și petrol*** *este bine securizat de jur împrejur. În general, există o distanță considerabilă între locul în care au loc* ***lucrările de teren*** *și intrarea în șantier.*

C. Translation model

Cele mai comune metode de generare a energiei electrice sunt ***cărbunele***, ***gazul*** *și* ***petrolul****. Cu toate acestea,* ***centralele hidroelectrice*** *și* ***solare,*** *alături de* ***morile de vânt****, sunt la cerere atât din țările în curs de dezvoltare, cât și din țările dezvoltate. Deși infrastructura de generare a energiei folosind centrale solare diferă de* ***conductele de gaz****, ambele șantiere includ structuri pentru stocarea și transmiterea energiei generate.*

D. Translation model

Instalațiile de gestionare a deșeurilor *se găsesc de obicei la marginea orașelor/periferie. Acestea sunt conectate prin* ***sisteme de canalizare*** *la infrastrucutra comercială și rezidențială.* ***Aeroporturile***, ***autostrăzile***, ***podurile***, ***porturile*** *și* ***căile ferate*** *fac parte din infrastructura de trafic și transport. Acestea sunt unele dintre cele mai importante proiecte de infrastructură pentru care țările optează, generând miliarde de euro pe an și adesea reprezentând o parte semnificativă din PIB.*

UNIT 8: MACHINES AND TOOLS USED IN CIVIL ENGINEERING

Exercise 1

A. bulldozer (bulldozer); **B.** grader (greder/autogreder); **C.** backhoe loader (buldoexcavator); **D.** dump truck (basculantă); **E.** forklift (stivuitor); **F.** drum compactor (cilindru compactor); **G.** boom truck (camion cu macara); **H.** tower crane (macara turn); **I.** scissor lift (nacelă foarfecă); **J.** front loader (încărcător frontal);

Exercise 2A

A – 7; B – 4; C – 3; D – 6; E – 2; F – 5; G – 1;

Exercise 2C

load – sarcină/ încărcătură; blade – lamă; sand – nisip; gravel – pietriș; rail cars – vagoane; air pockets – goluri de aer; revolving drum – cilindrii rotativi/cilindrii autobetoniere;

Exercise 3

1. warehouse; **2.** scissor lift or tower crane; **3.** boom truck; **4.** dump truck; **5.** grader; **6.** drum compactor; **7.** loader; **8.** bulldozer;

Exercise 5

A. angle grinder – polizor unghiular/ flex; **B.** jackhammer (pick hammer) – ciocan pneumatic; **C.** pickaxe – târnăcop; **D.** rotary hammer/ rotary hammer drill – ciocan rotopercutor; **E.** utility knife – cuter; **F.** trowel – mistrie;

Exercise 6

A. Translation model

Polizorul unghiular *(sau polizorul cu disc) este o* ***unealtă electrică*** *de mână cu un mic disc rotativ și abraziv folosit pentru* ***tăierea*** *sau* ***șlefuirea*** *zidăriei, betonului sau a oțelului.*

B. Translation model

Un ***ciocan pneumatic*** *este un aparat acționat manual care funcționează cu aer comprimat, hidraulic sau electric. Această unealtă este folosită de cele mai multe ori pentru* ***a efectua*** *lucrări de demolare.*

C. Translation model

*Un **târnăcop** este o unealtă manuală prevăzută cu un mâner scurt, utilizată în special ca unealtă manuală de **săpat**.*

D. Translation model

*Termenul '**mistrie**' se referă la oricare dintre diversele **unelte de mână** folosite pentru a **aplica**, **împrăștia**, **modela** sau **netezi** diferite tipuri de materiale cum ar fi betonul.*

E. Translation model

*Un **cuter** este o **unealtă de tăiere** cu o lamă ascuțită care poate fi retrasă într-un mâner de obicei metalic.*

F. Translation model

*Un **ciocan rotopercutor**, numit și burghiu rotopercutor, este o unealtă electrică care poate îndeplini **sarcini dificile**, cum ar fi **găurirea** și **dăltuirea** materialelor dure.*

Exercise 7

Translation model:

Subject: Technical overhaul of tools and machines
Good day,
Please check the technical condition of the machines and tools in the following list:

- *10 angle grinders;*
- *5 jack hammers;*
- *3 dump trucks;*
- *1 scissor lift;*
- *2 forklifts;*
- *4 bulldozers;*
- *approval of the mobile crane.*

These checks must be completed by 23.04.2023 as the equipment and tools will be used to complete a section of a road.
Kind regards,
Eng. Ionescu Ciprian

UNIT 9: PERSONAL PROTECTIVE EQUIPMENT

Exercise 2

A. safety; **B.** knee; **C.** clothing; **D.** plugs; **E.** composite; **F.** hard; **G.** glasses; **H.** vest; **I.** dorsal; **J.** apron

Exercise 4

A. hard hat; **B.** composite toe shoes; **C.** safety glasses; **D.** protection mask; **E.** knee pads; **F.** safety harness; **G.** earmuffs; **H.** hazmat suit; **I.** protection gloves; **J.** reflective vest; **K.** welding helmet; **L.** overalls

Exercise 5

A. False; **B.** False; **C.** True; **D.** False; **E.** True; **F.** False; **G.** True; **H.** True; **I.** False; **J.** True

Exercise 6

A. Translation model

Oasele piciorului sunt ușor de deteriorat, iar o leziune a mușchilor sau a tendoanelor poate împiedica mișcarea normală a piciorului timp de câteva luni. Prin urmare, este extrem de important să se ia măsuri de precauție care să reducă la minimum riscul unei leziuni la picior. EPI-ul ideal pentru picior cuprinde vârfuri de oțel, pentru a proteja împotriva obiectelor căzute, și protecție din oțel pentru talpă intermediară, pentru a proteja împotriva rănilor prin înțepare sau penetrare în urma călcării pe obiecte ascuțite.

B. Translation model

Atunci când lucrează pe un șantier de construcții, pot exista ocazii în care lucrătorii trebuie să lucreze cu praf contaminat (cum ar fi azbestul) sau pot fi expuși riscului de a fi stropiți de substanțe chimice sau de metal, de împroșcare de la scurgeri de presiune sau de la pistoale de pulverizare, de a se încurca în propriile haine, de impact sau de penetrare. În aceste situații, ar putea fi necesară utilizarea de salopete convenționale sau de unică folosință, șorțuri sau costume chimice din diverse materiale, pentru a asigura protecția împotriva pericolelor de la locul de muncă.

C. Translation model

Protective equipment has been used since ancient times in non-military fields such as smithery. Master blacksmiths wore protective aprons and gloves when working with metals subject to very high temperatures. Headgear (hard hats used in areas such as mining and construction) was fairly rudimentary, but it helped to form a collective perception of the importance of safety measures in the workplace.

D. Translation model

Specialised helmets can be found not only in construction. For ten years, they have also been an indispensable item for electricians and electromechanics. Most often we find at least one of EN 397 or EN 50365. The first refers to helmets providing vertical shock absorption, penetration resistance and flame resistance. These helmets must also be fitted with a chin strap.

Exercise 7

A. The texts discuss about the following types of PPE: head protection, ear protection and lung protection.

B. The workers exempted from using hard-hats are the Sikhs who wear turbans.

C. Ear protection is needed to protect workers from noise hazards.

D. The available types of ear protection are: earplugs, earmuffs and semi insert/canal caps.

E. Workers encounter hazards such as dust, gases and vapors.

F. If incorrectly fitting respiratory PPE is selected, an adequated seal might not be formed, leaving workers susceptible to workplace hazards.

UNIT 10: ROADS AND RAILROADS

Exercise 1

A. ballast; **B.** pavement; **C.** tarmac; **D.** locomotive; **E.** pedestrian crossing; **F.** buffer stop; **G.** lane; **H.** driveway; **I.** cul-de-sac; **J.** monorail

Exercise 2

A. hoof-sized stone blocks, similarly, sized wooden blocks, bricks, McAdam's broken stone, and occasionally asphalt and concrete

B. It was difficult to maintain and was usually either slimy or dusty as a consequence of water, weather, and copious amounts of horse excrement.

C. Vehicle speeds increased rapidly, the available friction between road and tire became critical for accelerating, braking, and cornering. In addition, numerous pavement failures made it obvious that much stronger and tougher materials were required.

D. Asphalt is a mixture of bitumen and stone, and concrete is a mixture of cement and stone.

E. The first road use of asphalt occurred in 1824, when asphalt blocks were placed on the Champs-Élysées in Paris.

Exercise 3

macadam; highway; ballast; steam locomotive; sleeper; manhole; one way street; tunnel; traffic light; train station;

Exercise 4

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
F	**T**	**F**	**T**	**F**	**F**	**F**	**T**	**T**	**T**

Exercise 5

A. Translation model

De la începutul secolului al XX-lea, pe măsură ce automobilul și camionul au oferit niveluri tot mai ridicate de mobilitate, numărul de vehicule deținute pe cap de locuitor a crescut. Nevoile rutiere au fost puternic influențate de această popularitate și, de asemenea, de deplasarea în masă a oamenilor către orașe și, de aici, către periferiile suburbane - o tendință care a dus la creșterea nevoilor de deplasare și a congestiei rutiere, precum și la orașe cu densitate scăzută, care sunt dificil de deservit de transportul public.

B. Translation model

În prima jumătate a secolului al XX-lea, progresele în tehnologia feroviară și în practicile de exploatare au fost limitate. Unul dintre cele mai importante a fost perfecționarea tracțiunii diesel ca o alternativă mai eficientă la abur și ca o opțiune mai rentabilă decât electrificarea în cazul în care circulația trenurilor nu era intensă. Un alt exemplu a fost trecerea de la metodele de semnalizare mecanică și de control telefonic al traficului la sistemele electrice care au permis controlul centralizat al unor zone de trafic considerabile.

C. Translation model

Even as the automobile and airplane became prominent, railroads developed the technologies needed to compete with them in the vital intercity transportation market. Today, train manufacturers and rail operators have the capacity to provide equipment and services that carry passengers over long distances at average speeds of 200 km per hour or more. In April 2007, a special TGV (Train à Grande Vitesse) high-speed train operated by the French railways set a speed record of 574.88 km per hour on a test line in northern France.

D. Translation model

In modern usage the term road describes a rural, lesser travelled way, while the word street denotes an urban roadway. Highway refers to a major rural travelled way; more recently it has been used for a road, in either a rural or urban area, where points of entrance and exit for traffic are limited and controlled. The most ancient name for these arteries of travel seems to be the antecedent of the modern way.

Exercise 6

King´s Cross Station; Route 66; Grand Central Station; Abbey Road; Ho Chi Minh trail; Gare du Nord; Shibuya Crossing; Transfăgărășan Road;

UNIT 11: BRIDGES AND WATERWAYS

Exercise 1

A. foot; **B.** water; **C.** suspension; **D.** process; **E.** span; **F.** course; **G.** bridge; **H.** main

Exercise 3

bascule bridge, aqueduct, cable-stayed bridge, canal, culvert, hydrant, suspension bridge, cantilever bridge, irrigation, harbour

Exercise 4

A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
T	**F**	**F**	**T**	**T**	**F**	**T**	**F**	**F**	**T**

Exercise 6

A. Waterways include natural rivers and artificial waterways that may be rivers modified to guarantee navigation.

B. No.

C. Water quantity and the quality of the water and also the channel itself can change

D. The control of the quality of water.

E. Many are now being restored to appear as ‘natural’ as possible.

F. Rivers are the surface expression within each drainage basin of the way in which water from precipitation progresses through the hydrological cycle to seas or lakes.

Exercise 7

The United States of America, England, China, Italy, Bosnia & Herzegovina, Switzerland

UNIT 12: CONCRETE WORKS

Exercise 2A

1. cement silos; **2**. aggregates; **3**.additives; **4**. mixing unit; **5**. batch plant; **6**. aggregate bins or hoppers; **7**. cement truck/ concrete mixer; **8**. cement weigh scale; **9**. formwork (shuttering); **10**. concrete skip; **11**. chutes/ drop pipes; **12**. cement pump; **13**. stripping/ dismantling; **14**. conveyor belt;

Exercise 3

a. needs; **b.** dry mix; **c.** wet mix; **d.** aggregate; **e.** mixed; **f.** ensures; **g.** site; **h.** bigger; **i**. concrete

Exercise 4B

A. timber, steel, plastic, aluminum;

B. cost-effective (low cost), easy to make;

C. bolts and nuts;

D. strong and durable; shrinkage, warping or damage due to moisture does not occur in steel;

E. yes – plastic is a tightly bound material;

F. corrosion resistance, eco-friendly, safe, efficient;

Exercise 5

1. aggregate bins/hoppers; **2**. cement silos; **3**.additive tank; **4**. automated process; **5**. aggregate weight conveyor; **6**. water weigh scale; **7**. cement weigh scale; **8**. mixing unit; **9**. concrete transportation;

Exercise 6

A. Translation model:

Betonul este cel mai versatil material de construcție cu care puteți lucra. Acesta poate fi modelat în orice formă și poate fi folosit pentru aproape orice scop: ***fundații****, acoperișuri, podele,* ***alei****. Betonul poate fi pompat îmtr-o roabă, un camion sau într-o pompă.*

B. Translation model:

Frumusețea betonului este însă că îi puteți manipula și controla proprietățile fizice pentru a crea combinația perfectă de rezistență, durabilitate, ***lucrabilitate*** *și cost pentru fiecare utilizare sau condiție particulară. Cunoașterea de bază a modalităților în care amestecul de beton poate fi modificat pentru a se potrivi anumitor cerințe de utilizare și pentru a compensa diferitele condiții meteorologice și de* ***turnare*** *pe care le puteți întâlni este crucială pentru a vă asigura că aveți un proiect de succes.*

C. Translation model:

Betonul este realizat prin combinarea a trei ingrediente principale: ciment Portland, apă și agregat. Cimentul acționează ca lipici într-un amestec de beton. Combinat cu apă, formează o pastă care acoperă agregatul și leagă amestecul. Fără apă, cimentul și agregatele ar fi doar un amestec ***uscat****. Apa declanșează o reacție chimică la ciment; cunoscută sub numele de* ***hidratare****, această reacție este cea care face ca betonul să se* ***întărească****.*

D. Translation model:

Sarcina agregatului – pietriș și nisip – este de a crește rezistența betonului, reducând în același timp costul. Gândiți-vă la asta ca la ***umplutură*** *de ciment. Pietrele individuale (****agregat grosier****) se împletesc între ele, iar nisipul (****agregat fin****) se infiltrează în* ***goluri****.*

UNIT 13: STRUCTURAL COMPONENTS IN CIVIL ENGINEERING

Exercise 1A

A – 10; B – 4; C – 7; D – 8; E – 6; F – 5; G – 9; H – 3; I – 2; J – 1; K – 11;

Exercise 2

high-rise buildings; low-rise buildings; megastructures; superstructure; substructure; load bearing wall; compartment walls; external walls;

Exercise 3

1. substructură; **2.**suprastructură; **3.** pereți de rezistență/susținere; **4.** pereți despărțitori/ziduri despărțitoare; **5.** ziduri/pereți exteriori; **6.** megastructură; **7.** clădiri înalte; **8.** clădiri joase/clădiri cu puține niveluri;

Exercise 4B

Type of structure	Advantages	Disadvantages
load bearing structure	1.Sturdy and solid structure; 2. Excellent fire resistance; 3. Visually pleasing structures; 4. Inexpensive masonry construction tools and equipment ;	1. Peform poorly during earthquakes 2. Masonry work is time-consuming 3. Requires a lot of labor 4.Poor thermal insulating qualities
composite structure	1. Easy to transport; 2. Easy to install; 3. Adaptable structures to suit the needs of the construction design; 4. Heat and electicity are not a problem for composite constructions;	1. Costly structures; 2. Requires good and competent workforce; 3. Composite materials are more brittle and more easily damaged; 4.Specialised manufacturing process required;

Exercise 6

a. weight; **b.** superstructure; **c.** substructure; **d.** components; **e.** foundation; **f.** concrete; **g.** floor; **h.** walls; **i.** roof; **j.** staircase;

UNIT 14: SOME CONSIDERATIONS ON THE FUTURE OF CIVIL ENGINEERING

Exercise 1A

A – 2; B – 4; C – 1; D – 8; E – 5; F – 3; G – 6; H – 8;

Exercise 2

a. astronauts; **b.** minority; **c.** huge; **d.** degree; **e.** command centres; **f.** invaluable; **g.** spacecraft; **h.** supply; **i.** stations; **j.** payloads; **k.** enormously; **l.** terraforming; **m.** quite; **n.** exploration;

Exercise 3

A. low tensile strength; it often forms cracks;

B. by using bacteria that is able to produce limestone that would fill the gaps and cracks of concrete.

C. eliminating the need for repairing cracks, reducing maintenance costs, reducing CO2 emissions;

D. for underground and underwater structures; for structures where it is very difficult to intervene and repair damages;

Exercise 4

A. to connect the entire west coast of Norway; to reduce travel time by half;

B. $ 47 billion dollars;

C. the length of bridges; the climate (strong winds and waves), the height of bridges (that must allow boats to pass beneath them);

D. the longest cable-stayed bridge in the world; the longest and deepest subsea road tunnel in the world;

E. the height of the bridges – they must take into account the passing of the boats beneath the bridges;

F. that ships could accidently collide into bridges; reducing the risk of fires and traffic fatalities in the tunnels;

Exercise 5

A. Translation model

Ingineria cutremurelor este o subdiviziune a ingineriei structurale care se axează pe proiectarea structurilor capabile să reziste la nivelurile imense de stres cauzate de forțele seismice. Inginerii civili specializați în acest domeniu lucrează de obicei în zone geografice care se confruntă frecvent cu cutremure, permițându-le să testeze noi tehnologii în cadrul unor scenarii de cutremur întâlnite în lumea reală.

B. Translation model

Undele seismice cauzate de cutremure slăbesc stabilitatea clădirilor. Pentru a rezista unui cutremur, clădirile trebuie proiectate cu control seismic – în special clădirile mai înalte, deoarece prăbușirea lor ar putea provoca daune semnificative. O metodă ieftină de a obține controlul seismic este izolarea bazei. Această metodă pasivă izolează baza unei structuri de fundația sa folosind un set de rulmenți din cauciuc-plumb în fundația structurii care pot devia sau absorbi vibrațiile cauzate de undele seismice.

C. Translation model

Compania Antarctica Noua Zeelandă caută un nou antreprenor care să reamenajeze o stație de cercetare științifică pe cel mai sudic continent al lumii. Noua bază este o instalație autonomă formată din trei clădiri interconectate. Aceste clădiri cu două etaje sunt proiectate pentru a îndeplini constrângerile unice pe care le ridică construcția în Antarctica, susținând în același timp știința de vârf. Constrângerile includ temperaturi extreme cu un minim anual de -50°C, cuplat cu vânturi foarte puternice, umiditate extrem de scăzută și un sezon de vară de patru luni.

UNIT 15: PLUMBING FIXTURES

Exercise 2

a. chiuvetă; **b.** toaletă/WC; **c.** cadă; **d.** țeavă/conduct principală; **e.** apă rece; **f.** apă caldă; **g.** placă de beton; **h.** robinet de închidere; **i.** izolație; **j.** scurgere lentă; **k.** înfundat; **l.** scurgere de apă; **m.** garnitură; **n.** canalizare municipală;

o. fosă septică; **p.** vidanjă; **q.** apă de ploaie; **r.** jgheaburi; **s.** întreținere/mentenanță; **t.** reparație; **u.** apă dură; **w.** rugină; **x.** robinet;

Exercise 3

A – 5; B – 14; C – 12; D – 18; E – 11; F – 10; G – 6; H – 4; I – 7; J – 16; K – 2; L – 13; M – 9; N – 17; O – 8; P – 3; Q – 1; R – 15.

Exercise 4

A. Translation model

Indoor plumbing installations are the hot and cold water pipes routed through walls, which connect the external water network to technical equipment or to sinks, toilets, and bathtubs. You also need to consider the drainage pipes inside the house

B. Translation model

Outdoor plumbing installations are the pipes used to transport water to the home and household waste to the sewage system. If such a system does not exist, you need to consider installing a septic tank in a secluded area of the yard that allows access for a vacuum truck.

C. Translation model

Cold Water Installations - The cold water pipes supply the entire home with water, including heating or water heating equipment (boiler, central heating unit, etc.). These pipes must be resistant to corrosion, to the effects of hard water, and must not rust. It is very important that they withstand high pressure.

D. Translation model

Hot Water Installations - The most important aspect of the hot water supply system is the pipes that make it up. These must be made of materials resistant to high temperatures.

E. Translation model

Sewer Installation - Before starting work on the drainage system in your home, you need to consider a very important aspect: the maximum flow rate of wastewater from the kitchen and bathroom. Also, don't forget to choose durable materials for the drain pipes to avoid the risk of an accident.

Exercise 5

A – distribution networks; B – water abstraction systems; C – water supply source; D – pumping stations; E – water storage tanks; F – water treatment plants.

Exercise 6

1. fontă; **2.** aerisiri; **3.** corpuri/obiecte sanitare; **4.** deșeuri; **5.** pantă; **6.** vidanjă; **7.** fosă septică; **8.** canalizare municipală; **9.** jgheaburi; **10.** placă de beton; **11.** stație de epurare a apelor uzate; **12.** robinet de închidere; **13.** gură de curățare/ gură de acces.

Exercise 7

A. Suggestion

Wastewater from sinks, toilets, showers, and appliances flows through pipes inside the house. These pipes connect to a larger main pipe that carries the waste out of the house. From there, the waste travels through underground sewer pipes and eventually reaches the municipal drain system, which takes it to a sewage treatment plant for cleaning before being released back into the environment.

B. Suggestion

If a house is not connected to a municipal drain, it usually uses a septic system. Wastewater flows into a septic tank, where solids settle at the bottom and liquids flow into a drain field to be filtered by the soil. The septic tank needs to be emptied regularly by a vacuum truck to prevent overflow or damage.

C. Suggestion

Waste vents are pipes that allow air to enter the plumbing system. They help maintain proper pressure in the pipes so that water and waste can flow smoothly. Without vents, drains could become slow or noisy, and harmful sewer gases might enter the house.

D. Suggestion

Rainwater is usually collected through gutters and directed into storm drains or rainwater harvesting systems. Collected waste from homes goes through sewer pipes to a sewage treatment plant, where it is filtered, cleaned, and treated before being safely released into rivers, lakes, or reused for irrigation or industrial purpose

UNIT 16: HEATING FOR BUILDING SERVICES

Exercise 1

A – radiator; B – underfloor heating; C – insulation; D – thermostat; E –boiler; F – ductwork; G – flue; H – furnace; I – heat pump;

Exercise 2

A. boiler; B. cuptor; C. radiator; D. încălzire prin pardoseală; E. pompă de căldură; F. HVAC – Sistem HVAC "Încălzire, Ventilație și Aer Condiționat – Heating, ventillation and air conditioning".

Exercise 4

A. Suggestion

Un sistem de încălzire, ventilație și aer condiționat care reglează climatul interior. - HVAC

B. Suggestion

Un schimbător de căldură care transfer căldura din apa fierbinte sau abur către aer. – Radiator

C. Suggestion

Un dispozitiv care produce abur pentru încălzire. – Boiler

D. Suggestion

Un dispozitiv care încălzește aerul și îl distribuie în întreaga clădire. – Furnace

E. Suggestion

Un dispozitiv care transfer căldura dintr-un loc în altul. – Heat pump

F. Suggestion

Un system care încălzește suprafața podelei pentru a distribui căldura uniform. – Underfloor heating

Exercise 5

A. Radiant heating – încălzire radiantă; B. heat exchanger – schimbător de căldură; C. hydronic heating – încălzire hidronică; D. thermostat – termostat; E. ductwork –

rețea de conducte; F. HVAC – Sistem HVAC "Încălzire, Ventilație și Aer Condiționat – Heating, ventillation and air conditioning": G. Furnace – cuptor; H. geothermal heating – încălzire geotermală; I. zone heating – încălzire pe zone; J. combustion chamber – cameră de ardere; K. boiler – boiler; L. flue – coș de fum: M. forced air-heating – încălzire cu aer forțat; N. radiator – radiator; O. heat pump – pompă de căldură.

Exercise 5

1. The **radiator** in the living room was not heating up properly, so I called a technician to fix it.

2. In the winter, our house is kept warm by a gas-powered **furnace**.

3. A **hydronic heating** system uses water to distribute heat through pipes and radiators.

4. The **zoned heating system** allows us to control the temperature of different rooms individually.

5. The technician checked the **flue** for any blockages to ensure the exhaust gases could exit the building.

6. An efficient **HVAC** system can provide both heating and cooling for a building.

7. The **heat exchanger** transfers heat between two fluids without mixing them.

8. In colder months, the **geothermal heat pump** moves heat from the ground into the house.

9. The **combustion chamber** is a crucial part of the furnace where fuel is burned.

10. **Radiant** heating directly warms the floor, walls, or ceiling to create a comfortable indoor environment.

11. The **forced-air heating system** uses air ducts to distribute warm air throughout the building.

12. A **boiler** is responsible for heating water or producing steam for heating purposes.

13. **Geothermal** systems use the earth's natural heat to provide energy-efficient heating.

14. Regular maintenance of the **ductwork** is essential to ensure even distribution of heated air.

15. We installed a **thermostat** to automatically adjust the indoor temperature based on our preferences.

UNIT 17: PLUMBING TOOLS AND FIRE PROTECTION IN BUILDING SERVICES

Exercise 1

1. access panel – panou de acces/ ușiță de vizitare; **2.** backwater valve – supapă antiretur/ antirefulare; **3.** Ball valve – robinet cu bilă; 4. check valve – supapă de sens; **5.** nipple – niplu**; 6.** PVC pipe – țeavă din PVC; **7.** septic tank – fosă septică; **8.** P-trap – sifon (tip P), **9.** vent pipe – țeavă de aerisire/ventilație; **10.** elbow- cot; **11.** Tee (fitting) – record în T; **12.** Pipe cutter – foarfecă pentru țevi; **13.** pipe bender – unealtă pentru îndoit țevi; **14.** Basin wrench **–** cheie pentru chiuvetă/baterii; **15.** strap wrench – cheie cu bandă; **16.** drain snake – dispozitiv de desfundat țevi/ șarpe de desfundat; **17.** Toilet auger -șarpe pentru toaletă.

Exercise 2B

thread – filet: valve – robinet/supapă; fitting – record/fiting; smoothly – lin/uniform; bend – cot/curbă; faucet – robinet; to grip – a prinde/a apuca ferm; to slip – a aluneca; to scratch – a zgâria; strap – bandă/curea**;** to wrap – a înfășura; clogs – înfundări/blocaje.

Exercise 3

A. – angle stop; **B.** – backwater valve; **C.** – ball valve; **D.** – check valve; **E.** – nipple; **F.-** elbow; **G**. – septic tank; H. – P-trap; **I.** – PVC pipe; **J.** – pipe shears/ pipe cutters; **K.** – pipe wrench; **L.** – drain snake.

Exercise 4 - Suggestion

Good afternoon,

I have checked the problem with the sink and noticed that the trap is cracked, which allows unpleasant odors to escape. We will need to replace it. In addition, the drain pipe has a damaged bend, so we will need a new 90° elbow.

To connect the parts, we will use a nipple and a T-fitting, since we need to join three pipes. PVC pipes are suitable for this job.

We will use a pipe wrench and a basin wrench to dismantle the old parts. If there are blockages, I will use a drain snake or a toilet auger, depending on where the problem occurs.

Please confirm if you would like us to proceed with the repair.

Respectfully,

Mihai Popescu

Licensed plumber

Exercise 6

1. heat; **2.** location; **3.** steel; **4.** carbon monoxide; **5.** roles;

Exercise 8

1. portable extinguishers; **2.** fire blankets; **3.** automatic sprinklers; **4.** fire detectors; **5.** foam estinguishers.

UNIT 18: AN INTRODUCTION INTO ARCHITECTURE

Exercise 1B

1. template – șablon; **2.** guidelines – linii directoare / instrucțiuni; **3.** stonework– zidărie / lucrări în piatră; **4.** pointed arch – arc frânt / arc în ogivă; **5.** ribbed columns – coloane nervurate; **6.** vaulted columns – coloane boltite; **7.** flying buttress – contrafort arcuit / contrafort zburător; **8.** distortion – distorsiune; **9.** elongated – alungit; **10.** to stand out – a ieși în evidență / a se remarca; **11.** (to be) reminiscent – care amintește de / evocator; **12.** uncluttered – aerisit / neaglomerat / simplu; **13.** free-standing columns – coloane independente / libere; **14**. to encompass – a cuprinde / a include; **15.** prominent – proeminent / evident; **16**. clean structure – structură clară / structură simplă; **17.** function over form – funcționalitate înaintea formei; **18.** advances – progrese / inovații; **19.** austerity – austeritate / sobrietate; **20.** to flourish – a prospera / a înflori

Exercise 2

A. *The tallest construction in Barcelona will be the Sagrada Familia, reaching a final height of 172 meters once the central Tower of Jesus Christ is completed.*

B. *The main problem with building the towers of the Sagrada Familia is the complexity of assembling massive prefabricated stone panels at great heights,*

requiring precise placement and coordination using cranes and advanced engineering techniques.

C. *The stone used for the Sagrada Familia comes from various quarries in Spain, including Montjuïc (historically) and newer sources selected for durability and visual consistency. The TIME documentary highlights the use of modern prefabricated stone panels crafted off-site and transported to Barcelona for assembly.*

D. *The wall pieces used to build the towers measure approximately 7.25 meters in height, are several meters wide, and weigh up to 24 tons each. These massive panels are lifted and installed using specialized cranes.*

E. *Antoni Gaudí worked on the Sagrada Familia for 43 years, from 1883 until his death in 1926. During this time, he transformed the original design and devoted the last 15 years of his life almost exclusively to the basilica.*

Exercise 3

A. acoperiș boltit – curved roof; B. acoperiș în 4 ape/ acoperiș cu coamă – hip/hipped roof; C. acoperiș în 2 ape – two ridged roof/ gable roof; D. acoperiș într-o apă – skillion roof; E. acoperiș plat – flat roof; F. acoperiș în 2 ape nesimetrice – saltbox roof; F. acoperiș cu falsă mansardare/ tip baroc – mansard roof.

Exercise 5A

A. top plates/wall plate – cosoroabă; B. roof decking – astereală; C. collar beam – clește; D. purlin roof – pană de coamă; E. strut – contrafișă; F. king post – pop; G. placă de beton – concrete slab; H. coamă – ridge board; I. căprior – rafter.

Exercise 5B

1. rafter; 2. ridge board or ridge (of a roof); 3. concrete slab; 4. support beam/ tie beam; 5. King post/ post, or prop; 6. strut/brace; 7. purlin roof/ ridge puring; 8. collar tie/ tie beam; 9. roof decking/ sheating; 10. wall plate/top plates/eaves beam.

Exercise 6B

1. șarpantă – roof frame/roof truss; 2. panta acoperișului – roof slope/roof pitch; 3. jgheab – gutter; 4. burlan – downspout/drainpipe; 5. parazăpadă – snow guard/snow stopperș 6. cornișă – cornice/eaves trim; 7. dolie- valley flashing/roof

valley; 8. versant – roof slope; 9. învelitoarea acoperișului – roof covering/ roof material.

UNIT 19: REVISION PART 1

Exercise 3

Jobs in the Construction Industry: construction manager, welder, plumber, forklift operator, crane operator, mason, plasterer, site manager, bricklayer, electrician.

Types of Constructions: residential buildings, commercial buildings, industrial buildings, institutional buildings, assembly buildings, business/office buildings, road infrastructure, bridges, tunnels, railway infrastructure, waterway infrastructure.

Parts of a house: A. Structural – foundation, load-bearing walls, beams , colums, slabs; B. By rooms – living room, dining room, hallway, kitchen, bathroom, attic, pantry; C. Exterior elements – roof, porch, balcony, driveway, fence.

Exercise 4

HVAC – Heating, Ventillation and Air Conditioning; **AC** – Air Conditioning; **PPE –** Personal Protective Equipment; **HV** – High Voltage; **KG** – Kilogram; **CM** – Centimenters, **RPM** – Revolutions Per Minute.

Exercise 5

1. I'm a bricklayer. I lay **bricks**.
2. I'm a **plasterer**. I do the walling and the plastering.
3. I'm a **HVAC technician**. I do the heating, ventilation, and air conditioning.
4. I'm a carpenter. I work with **wood**.
5. I'm a **glazier**. I install windows.
6. I'm a painter. I use **paint** to decorate houses.
7. I'm a welder. I weld **metal**.

Exercise 6

1. To adjust – a ajusta; 2. To attach – a atașa; 3. To fill in - a umple/ a completa;
4. To bind – a îmbina; 5. To level – a nivela; 6. To nail – A bate cuie în
7. To slide onto – a glisa pe/ a introduce prin alunecare; 8. Fit – a portivi, a instala

UNIT 20: REVISION PART 2

Exercise 2B

Suggestion

1. Hammer – a hamer is used to drive nails into wood, break objects apart or shape materials on a construction site.
2. Screwdriver – a screwdriver is designed to insert or remove screws. They are available in different types such as flathead or Phillips.
3. Pliers – hand tools used to grip, bend, or cut wires or small metal pieces.
4. Chainsaw – a powerful electrical tool used to cut wood, trees, or large timber pieces quickly.
5. Caulking gun – a gun used to apply sealant into gaps or joints, helping to make structures watertight.
6. Wrench – used to tighten or loosen nuts and bolts.
7. Wheelbarrow – a small hand-pushed cart used to transport materials like sand, concrete, or bricks around the site.
8. Bolt – a bolt is a threaded fastener used with a nut to join two or more construction components.
9. Welding torch – used to join metal parts together by melting them with intense heat.
10. Drill- a power tool used to make holes in wood, metal, or concrete. It can also be used to drive screws into various surfaces.

Exercise 3A

concrete; wooden beams/planks; bricks; insulation panels; tiles; PVC pipes; paint; steel rebar; glass; plaster; construction site.

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