

## ТЕМА 2.4.3. ИНЖЕНЕРНЫЕ СИСТЕМЫ ЗДАНИЙ BUILDING SERVICES

### ACTIVE VOCABULARY

#### 1. Use the QR-code and learn the words and word combinations.

Circuit, circulate, conductivity, distribute, installation, meter box, pipe, plumbing system, pump, sewage system.



#### 2. Complete the table with appropriate derivatives according to the model.

*Model: To connect — connection*

Action	Process
to install	
to circulate	
to distribute	
to generate	
to radiate	
to transmit	
to consume	
to maintain	
to remove	
to control	
to select	
to absorb	

#### 3. Match the words to their Russian equivalents.

- |                 |                 |
|-----------------|-----------------|
| 1. consumption  | a) амперы       |
| 2. hard-wired   | b) окружающий   |
| 3. outlet       | c) свободный    |
| 4. humidity     | d) скрывать     |
| 5. ambient      | e) проводной    |
| 6. give off     | f) потребление  |
| 7. conductivity | g) влажность    |
| 8. conceal      | h) проводимость |
| 9. unobstructed | i) розетка      |
| 10. amps        | j) отдавать     |

#### 4. Give Russian equivalents to the sentences. Pay attention to the verb forms in the Passive Voice.

1. Building services *are installed* in buildings to make them comfortable, functional, efficient and safe. 2. The domestic hot water supply *is provided* by means of water heater appliances, or through district heating. 3. Used water and wastes *are carried away* by the drainage, waste and vent system. 4. The outdoor air *is drawn* into the buildings and *heated* or *cooled* before it *is distributed* into the occupied spaces. 5. Central heating systems *are usually found* in colder climates to heat buildings. 6. The water *is heated* in a heating boiler and then *circulated* through pipes to radiators or convectors. 7. Heat *is absorbed* by the surfaces and objects in the room and *radiated* to provide warmth. 8. The installation *is concealed* except for thermostats and balancing valves. 9. The heat generator *is outsourced* to a district heating station. 10. The thermal energy *is transferred* to the building's heating system, avoiding the need for boilers in individual buildings.

### READING AND SPEAKING

#### 5. Read the text Building Services and complete the statements.

1. The text tells us about....
2. It specifies....
3. The text also mentions....

## BUILDING SERVICES

**Building services** are the systems installed in buildings to make them comfortable, functional, efficient and safe. They can be considered under three main headings: plumbing, electrical engineering and mechanical engineering. For this reason, they are also called MEP services (for mechanical, electrical, and plumbing).

**Plumbing** deals with the supply of potable water, which is essential for human consumption and sanitation. In order to maintain sanitary conditions within a building and the surrounding area, the waste water must be disposed of efficiently.

The distribution of drinking water and the removal of waterborne waste in a building are carried out by means of a plumbing system which consists of pipes and fixtures. The main difference between a plumbing system and a water and sewage system is that the former supplies one building, whereas the latter serves a group of buildings or a city. Plumbing installations must follow some regulations to ensure safety, quality construction. Today water supply systems use high pressure pumps and pipes made of non-toxic materials, such as copper, brass, steel, cast iron and plastic. The drinking water supply usually comes from a municipal water supply, water wells, streams, rivers, lakes or rainwater. It is fundamental that clean water is not contaminated by the waste water side of the processing system. The domestic hot water supply is provided by means of water heater appliances, or through district heating. Used water and wastes are carried away by the drainage, waste and vent system.

**Electrical systems** provide light as well as heat to a building and the power to run its machines.

An electrical system includes the electrical service, lighting outlets and hard-wired appliances. The electrical service is usually between 100 and 200 amps. Electrical lines run from the street to a meter box (situated outside the house), then to the electric panel board which contains the switches to control the electricity in each room of the house. It is there that the amps are divided up across circuits to supply the different areas of the house with electricity. Electrical systems must follow a number of safety measures including circuit breakers, ground-fault circuit interrupters and smoke alarms, and their installation must be checked by an inspector when the house is finished, to make sure that it is safe.

**Mechanical engineering** deals with the heating, ventilation and air-conditioning of interior space. It also includes the planning of elevators and escalators, with the necessary operating equipment and vertical shafts.

**Heating, ventilation, and air conditioning (HVAC)** is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space. Its goal is to provide thermal comfort and acceptable indoor air quality. Depending on outdoor conditions, the outdoor air is drawn into the buildings and heated or cooled before it is distributed into the occupied spaces, then it is exhausted to the ambient air or reused in the system. The selection of HVAC systems in a building depends on the climate, the age of the building, the individual preferences of the owner of the building and a designer of a project, the project budget, the architectural design of the building.

**Building services engineers** are responsible for the design, installation, operation and maintenance of all systems. They work closely with other construction professionals and can influence the architecture of a building. Furthermore, they play a significant role in the sustainability and energy consumption of a building. In recent years, new demands have emerged in this area, such as the utilization of renewable energies, low carbon technologies and energy management.

6. Use the QR-code and distribute the terms into three groups.



7. A. Find English equivalents to the word combinations in the text *Building Services*.

Обеспечить безопасность; водопроводная система, питьевая вода; канализационная система; соблюдать нормативные требования; нетоксичные материалы; насос высокого давления, электроснабжение; пожарная сигнализация; автоматический выключатель; меры безопасности; контролировать температуру и влажность.

**B. Choose three word combinations from ex. 7. A and make up sentences with them.**

**8. Complete the sentences according to the text *Building Services*.**

1. Building services can be considered under three main headings; .... 2. Plumbing deals with .... 3. A plumbing system consists of .... 4. The drinking water supply usually comes from .... 5. Used water and wastes are carried away by .... 6. An electrical system includes .... 7. Electrical systems must follow a number of safety measures including .... 8. Heating, ventilation, and air conditioning (HVAC) is the use of various technologies to control .... 9. The selection of HVAC systems in a building depends on .... 10. Building services engineers are responsible for ....

**9. Work in pairs. Discuss the questions.**

1. What is the purpose of building services installed in buildings? 2. Mechanical engineering deals with the heating, ventilation and air-conditioning of interior space, doesn't it? 3. What is carried out by means of a plumbing system? 4. Where does the drinking water supply usually come from? 5. What is the difference between a plumbing system and a water and sewage system? 6. What materials are used in water systems today? 7. What does an electrical system include? 8. Where is a metre box situated? 9. Who checks the installation of electrical systems when the house is finished? 10. What are heating, ventilation, and air conditioning in buildings used for?

**8. Find and underline key words and word combinations in the text *Building Services*.**

**9. Make up a short summary of the text *Building Services*. Retell it using your notes.**