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ЗНАЧЕНИЕ ПРОФЕССИИ ИНЖЕНЕРОВ-СТРОИТЕЛЕЙ В ИСТОРИИ И СОВРЕМЕННОСТИ

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Резюме: Трудно переоценить роль инженеров-строителей в истории человечества. Инженер-строитель – ключевая фигура в возведении зданий и разнообразных конструкций. Именно он направляет и контролирует осуществление строительства. После архитектора, инженер-строитель стоит на втором месте по владению всеми вопросами, связанными с возведением постройки. На этапе планирования, он является специалистом, который решает, какие материалы будут использованы. Определяющие факторы при этом – свойства и уровень качества строительных материалов. В ходе воплощения проекта в реальность роль инженера-строителя продолжает оставаться ключевой. Возникла профессия строителя в древние времена, когда людям потребовалось сооружение жилищ и убежищ от опасностей окружающего мира. Вся работа инженеров может быть представлена как совокупность выполнения множества разнообразных процессов, требующих высокого уровня профессиональной подготовки и личностных качеств.

Ключевые слова: профессия инженера, строительство, общекультурные компетенции, общетехнические компетенции, узкопрофессиональные компетенции, знания, навыки, умения

CIVIL ENGINEERING OVER THE TIME

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The role of construction in the history of mankind is difficult to overestimate. The civil engineer is a very important person in the construction work, since he is the one who manages and controls everything. After the architect-designer, the civil engineer is probably the second among those who know everything about the construction project. At the time of planning, it is this specialist who decides which building materials will be used. Here he relies on knowledge of their properties and qualities, the successful experience of predecessors and competitors. When the design turns into reality, the role of the civil engineers keeps being of crucial importance. The profession of a builder was born in ancient times, at the time when there was a need for shelter and overnight stay. The profession of a builder consists of dozens of different processes which are necessary for creating a quality building: Analytical and simultaneously imaginative-spatial thinking, attentiveness to detail, ability to manage a large staff, punctuality, strong health, focus on results.

Keywords: civil engineering, construction, general cultural competences, general technical competences, professional competences, knowledge, skills, abilities

The role of construction in the history of mankind is difficult to overestimate. All the once erected grandiose designs by our ancestors became real monuments of architecture. A lot of people took part in their construction, among them there were representatives of the profession, which we now call «civil engineering». Who is a civil engineer?

The civil engineer is a very important person in the construction work, since he is the one who manages and controls everything. After the architect-designer, the civil engineer is probably the second among those who know everything about the construction project. At the time of planning, it is this specialist who decides which building materials will be used. Here he relies on knowledge of their properties and qualities, the successful experience of predecessors and competitors. The profession of a builder was born in ancient times, at the time when there was a need for shelter and overnight stay. At that time, natural materials were mainly used, which did not require additional processing. “Engineering has been an aspect of life since the beginnings of human existence.

The earliest practice of civil engineering may have commenced between 4000 and 2000 BC in ancient Egypt, the Indus Valley Civilization, and Mesopotamia (ancient Iraq) when humans started to abandon a nomadic existence, creating a need for the construction of shelter. During this time, transportation became increasingly important leading to the development of the wheel and sailing” [4].

The first known construction engineer is the Egyptian Imhotep, who lived around 2700 BC. He built a pyramid on his own project, for the first time decided to use a stronger limestone instead of raw brick. With the passage of time, the processes of erection of architectural structures are rapidly developing. Today, everyone is struck by the scale of the Egyptian pyramids and ancient Greek temples.

The construction was developing rapidly. New technologies and materials appeared. Modern building processes have reached unprecedented heights. The profession of a builder consists of dozens of different processes which are necessary for creating a quality building: Analytical and simultaneously imaginative-

spatial thinking, attentiveness to detail, ability to manage a large staff, punctuality, strong health, focus on results.

The main responsibility of the civil engineer is to draw up a work plan for construction, repair, reconstruction, as well as process monitoring and management.

The profession of a civil engineer is very much in demand today. It requires special abilities that would allow future builders to work in this area. Getting special knowledge is necessary for becoming specialists. Now in our country it became possible to study the specialty of building remotely. That is a good way not only to get a basic education, but also to improve your qualification, without detaching yourself from the production process for a long time.

Future specialists need knowledge in such areas as mathematics, drawing, logic, architecture, they need and develop the ability to lead people, if you decide to become a foreman, that is, the leader of the team of builders. The choice of the profession of a building designer or a civil engineer must be based on sound knowledge in this area. "Civil engineer" covers a huge range of jobs and all types of engineering. Civil engineers come from all different backgrounds but they all spend years training, learning and getting qualifications". [3]

This profession is most often chosen by representatives of the male sex. This is due to fairly large physical loads. But women often choose this profession too; in particular, they work in such specialties as a painter or a finisher.

The civil engineer is, first of all, the manager, who is responsible for the terms and quality of the work. The engineer works on a project (or plan) for future work, determines the time frame. Then the selection of specialists begins, the selection of the necessary building materials, the schedule of work is determined. The next stage is the direct control of the installation of structures, the use of finishing materials, the conformity of work to all norms.

Builders are conventionally divided into two large groups: managers or engineers and executors.

Builders-managers. This group includes specialists with higher engineering education. They are engaged in the design of general and narrowly focused systems. Depending on the direction of activity, this group includes the following specialists:

- Civil Engineer. A specialist who manages the processes at the construction site. He selects materials and searches for personnel. The calculation of the budget is also in his duties.

- Design engineer. The given expert develops the plan of construction, makes all necessary calculations. In doing so, he/she chooses the type and composition of building materials. The design is based on their weight and strength.

- Constructor of communications. His/her duties: the design of electrical networks, sewerage, water supply and other systems.

- Engineer surveyor. Specialist in landscapes. It is the specialist who makes topographic studies, on the basis of which the type and construction of the foundation of the future structure is selected.

Managing specialties direct all processes and are responsible for the quality of the result.

- Builders-executors. This segment includes most construction specialties:

- Bricklayer. This is a specialist involved in the erection of houses. Works with the laying of stone, brick, slabs and any other materials.

- The roofer. Specialist in the field of roof covering. It is thanks to this specialist that the roof does not leak and keeps heat.

- Facing. Specialist in the application of decorative building materials on the floor, walls of structures. Usually, marble, sandstone, tile, etc. are used for the work.

- Finisher. Finishing all surfaces. That includes painting of walls, wallpapering, wood-working, plastering, etc.

- Electrician. Paves electrical networks, installs and reinstalls equipment.

- The painter. Specialist in the cultivation and application of paints.

- Electric gas welder. Specialist in welding processes. Owns gas and arc method.

The advantages of this profession can be attributed to the demand of the labor market and sufficient salaries. A person with a higher technical education of a civil engineer can rise very quickly along the career ladder and after a couple of years attain a position of the senior engineer or a project manager. However, this profession often involves an unregulated schedule, work day and night. The construction can take place both indoors and outdoors, as it is necessary to control workers in a variety of weather conditions.

The profession of a builder is considered to be highly in demand. The need for more comfortable housing is constantly increasing. Demand causes the need for new buildings and the opening of additional construction vacancies.

Based on the analysis of the basic duties of the engineer and the requirements imposed on the profession by the society of the 21st century, it can be concluded that it is necessary for engineers to possess the following qualities:

- developed abstract thinking;
- analytical mind;
- large amount of long-term and operational memory;
- high level of development of spatial thinking;
- emotional stability;
- high noise immunity.

Mindfulness is an irreplaceable quality. It helps to perform complex and dangerous processes in very extreme conditions. An important addition is a good eye, which allows not to spend too much time on making measurements.

Analytical and at the same time image-spatial thinking, attentiveness to details, ability to manage a large staff. Punctuality, good health, focusing on results are also crucially important.

The work of a civil engineer assumes an analytical mindset, technical thinking, good visual memory, an accurate eye, care and accuracy. All these qualities together will help the engineer to correctly carry out all necessary calculations and make projects.

Pros and cons of professions

The advantages of this profession can be attributed to the demand on the labor market and decent wages. A person with a higher technical education of a civil engineer can very quickly move up the career ladder and after a couple of

years attain a senior engineer or project manager. However, this profession often involves an unregulated schedule, work day and night. The construction can take place both indoors and outdoors, therefore it is necessary to control workers in a variety of weather conditions.

To become a true master, you need to be: patient and diligent; punctual and responsible; able to easily work in a team.

In addition, it is important to realize the following values:

- The value of human life;
- Preservation of the environment. [1:12–14; 2: 15–17]

Most people believe that the profession of a Civil Engineer cannot be called rare; in our country it is quite common. For several years, the labor market has seen a demand for representatives of the Civil Engineer profession, despite the fact that a lot of specialists are produced each year.

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