

Designing the organizational structure of construction

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Abstract

Building construction organizational structures is aimed at creating appropriate conditions for the cooperation of construction staff in order to complete a specific construction object. It should be associated with the process of organizing and allocating work, decision-making rights and resources to individual construction participants, along with providing appropriate resources so that they can perform their tasks correctly and safely. Construction organizational charts are helpful.

The article presents an example procedure for designing an organizational structure that may be useful in construction management.

Keywords: construction, organizational structure, design

1 Introduction

Building structures are anthropogenic objects, including technical ones, satisfying human needs in the broadly understood housing, which are created in the construction process including the design, construction, maintenance and demolition of buildings.

The participants of the construction process are; the investor, the investor's supervision inspector, the designer, the construction manager/works manager and the user/owner of the construction facility, each in their own scope [9].

The activities of participants in the construction process are regulated by construction law [Construction Law Act]. To construct (build) a building, resources are needed: people, materials and equipment. The amount of

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necessary resources results from the parameters of the building and the technology and organization of the construction process. This is a particularly important issue at the stage of construction works.

The construction manager is responsible for carrying out works on the construction site. His basic duties include:

- protocolized takeover from the investor and appropriate security of the construction site along with the construction facilities, technical devices and permanent points of the geodetic control network as well as protected elements of the natural and cultural environment;
- maintaining construction documentation;
- ensuring the geodetic delineation of the facility and organizing the construction and managing the construction of the building in a manner consistent with the design or building permit, regulations, including technical and construction regulations, and occupational health and safety regulations;
- coordinating the implementation of tasks preventing threats to safety and health protection (bioz) and ensuring compliance with the bioz principles contained in the regulations and the bioz plan during construction works;
- introducing necessary changes to the bioz information and the bioz plan, resulting from the progress of construction works;
- taking necessary actions to prevent unauthorized persons from entering the construction site;
- ensuring the use of products in the performance of construction works in accordance with legal requirements, as well as suspending construction works if a risk is identified and immediately notifying the competent authority thereof
- notifying the investor about an entry in the construction log regarding the suspension of construction works due to their performance not in accordance with the design;
- implementation of recommendations entered in the construction log;
- reporting to the investor for inspection or acceptance of completed works that are covered or disappearing, and ensuring that the tests and inspections of installations, technical devices and chimney flues required by regulations or specified in the contract are carried out before submitting the building for acceptance;
- preparation of as-built documentation of the construction facility;
- reporting the building for acceptance by making an appropriate entry in the construction log and participating in the acceptance activities and ensuring the removal of identified defects [16].

When building complex facilities, it may be helpful to develop an executive design. The executive design supplements and details the construction design in the scope and degree of accuracy necessary to prepare the bill of quantities, the investor's cost estimate, the preparation of the offer by the contractor and the implementation of construction works in the form of drawings on a scale taking into account the specificity of the ordered works and the scales of drawings used in the construction design along with descriptive explanations. , which concern: parts of the facility, construction and material solutions, architectural details and construction equipment, or the land infrastructure network, installations and technical equipment [3, 4, 10].

The executive design is an important document for the investor, as it is used to select a contractor, perform construction works, control their quality and accept the completed facilities, and also complements and details the construction design to the extent and accuracy necessary to prepare a bill of quantities, cost estimate and offer by the contractor [1,2,6].

The executive documentation of a specific construction site should be developed on the basis of scientific premises of the technology of construction processes, their organization, management and economics of construction implementation [8, 11].

2 Design of construction works

Designing the execution of construction works includes the design of technology and organization of construction works, economic analysis and a bio-development plan [1,7,13].

Designing construction works technology includes the following activities:

- identification of construction works that occur in the process;
- calculation of the number of works that will occur during the construction of the facility, mainly on the basis of the architectural and construction design and Material Outlay Catalogs);

- selection of machines and devices (technical facilities) needed to perform the planned works;
- calculation of the efficiency and working time of machines and devices along with the development of their work patterns on the construction site [6, 12, 14].

After completing the technological design, you can start designing a safe organization of works. The procedure for designing the organization of construction works includes the following activities:

- preliminary selection of the method of organizing works;
- calculation of the duration of individual works occurring in the process and the number of work teams;
- development of a network of dependencies between robots occurring in the process;
- execution of schedules: construction and/or individual works;
- development of construction site development: based on the calculated amounts of individual resources: construction workers, construction materials and equipment for carrying out works.

The diagram of the technology design procedure and work organization is presented in Fig. 1.

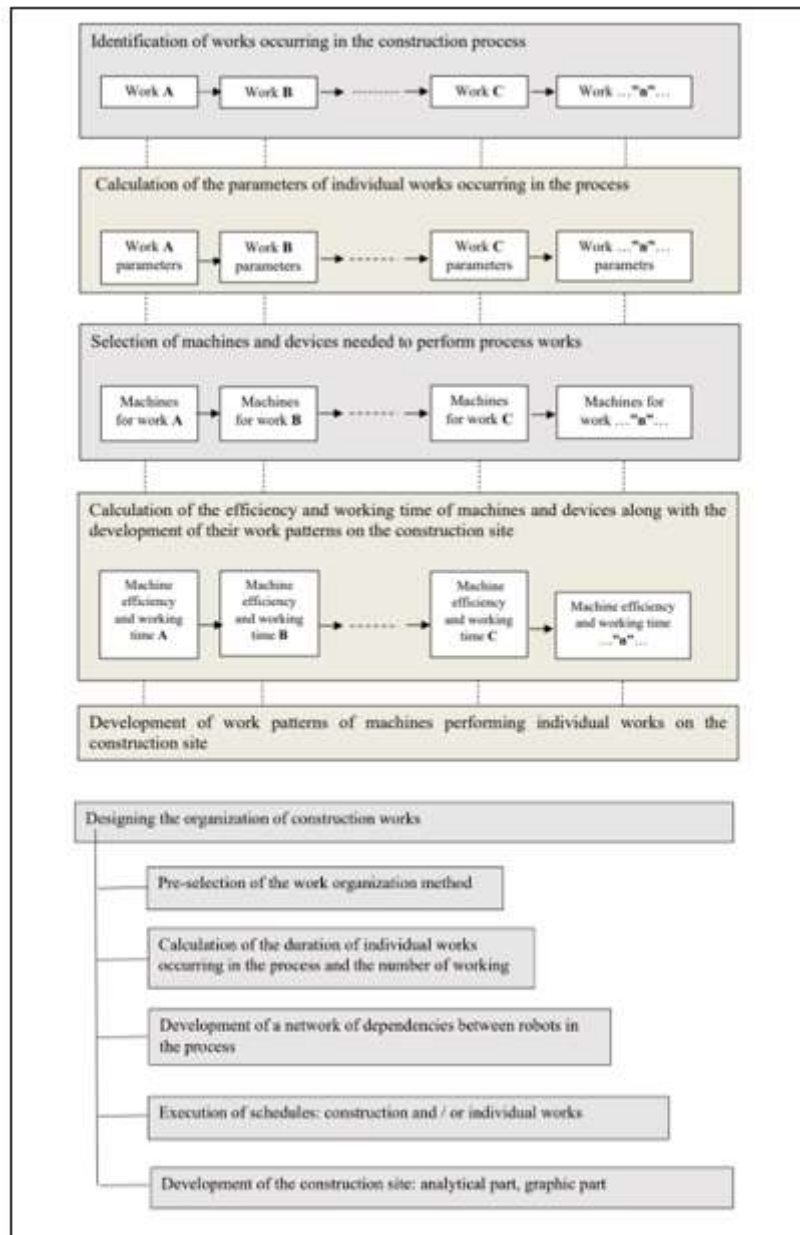


Fig.1. Diagram of the procedure for designing technology and organizing construction works [10]

3 Organizing construction human resources

Organizing is the process of creating and changing organizational structures, including arranging, allocating, coordinating activities and resources, establishing cooperation within the adopted construction structure, and introducing a specific order in which construction staff is a very important resource.

Personnel - construction staff is practically a team of employees whose goal is to perform precisely defined tasks related to the construction of a specific construction facility. This team includes workers and construction management who perform assigned tasks at their workstations in accordance with their competences and responsibility. An important element here is the delegation of powers, which involves the division of power and the transfer of some employee duties from the employer to the construction staff. A construction site is a place where workers employed by their employers perform assigned work under the supervision of a construction manager/works manager.

The construction manager is the link connecting construction works, managing human resources, materials and equipment on the construction site [5]. On the one hand, he serves as a representative of the employer - he is an element of the structure of the company that employs him, and on the other hand, he performs the highest management function at the construction site. He is also a member of the team implementing the construction project, which includes the investor, investment supervision inspector, designer, construction manager/works manager (Fig. 2).

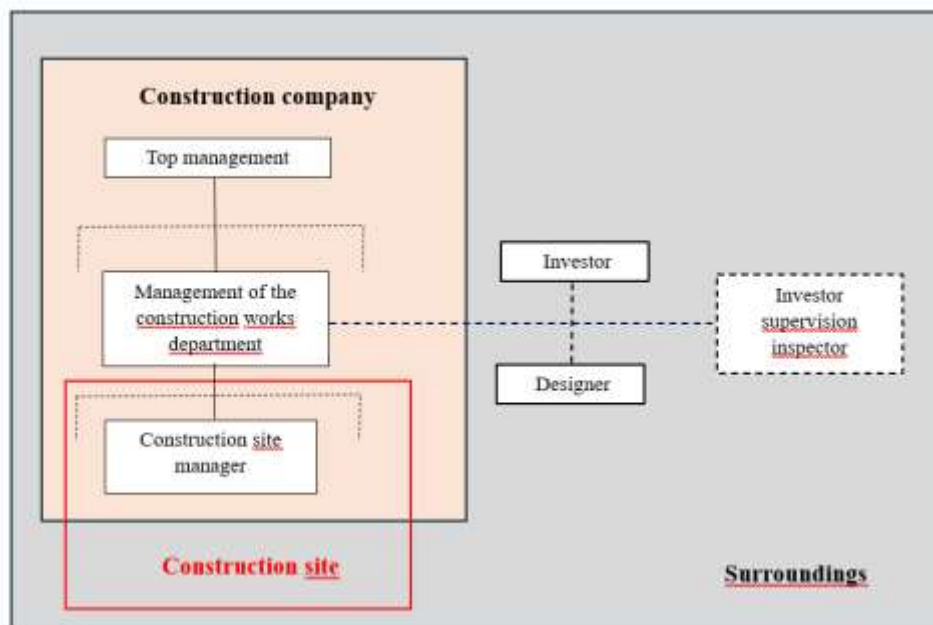


Fig.2. Construction manager as a link between the construction company and other participants of the construction process [10].

The construction manager is responsible for persons responsible for carrying out works on the construction site and for ensuring their appropriate quality. These may be managers of individual construction works, foremen, engineers, technicians or foremen. An example organizational structure of the construction site is shown in Fig. 3.

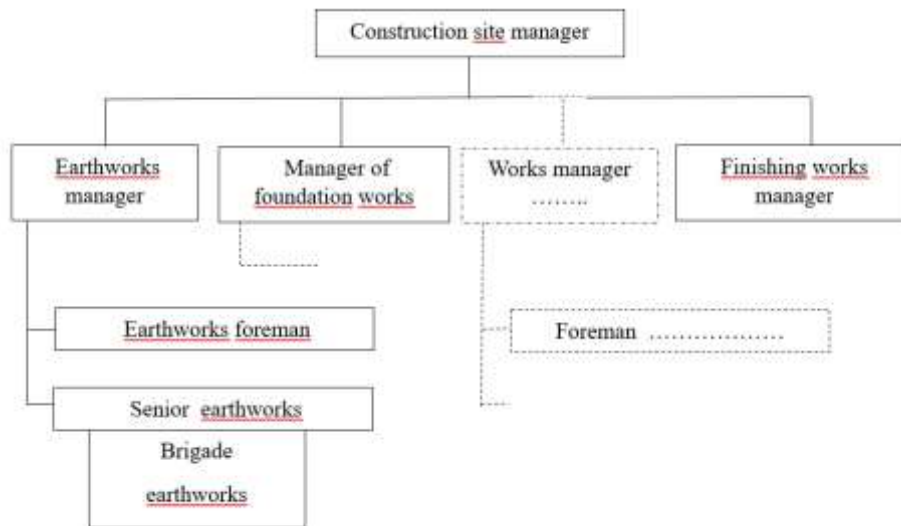


Fig.3. Sample construction organizational structure [10]

The scope of formal authority of the construction manager/construction management member results from the requirements of the position in which he is employed.

The tasks, competences and responsibilities of construction management members should be defined and adjusted to the requirements of the position in the organizational structure of the construction site. The basic duties of a construction manager/works manager are defined in the construction law [16] and the duties of persons managing employees are specified in the labor code [15].

An important issue in the work of construction management is motivating employees. Motivating includes the use of means to activate employees to act (positive motivation), but also the use of methods limiting undesirable actions and behaviors (negative motivation). Means of material interest, e.g. financial, as well as non-material interest, referring to higher needs, e.g. recognition, distinction or self-fulfillment, may be used here.

4 Conclusions

Building the organizational structure of the construction site is aimed at creating appropriate conditions for the cooperation of the construction staff in order to complete a specific construction object. It should be associated with the process of organizing and allocating work, decision-making rights and resources to individual construction participants, along with providing appropriate resources so that they can perform their tasks. Construction organizational charts are helpful.

The use of organizational charts should ultimately lead to a situation in which each activity of construction staff participants is carried out in the most effective way possible and in such a way that, together with others, it forms a unified whole, in accordance with the definition of prof. Kotarbiński, who defined an organization as a whole, all of whose components/parts contribute to the success of the whole.

Designing organizational structures in construction practice involves the proper selection of people, allocation of appropriate tasks and appropriate resources (tools, materials) to carry out planned tasks within a specified time. Along with the division of tasks, employees should be assigned appropriate rights and responsibilities. Each construction worker (management, workers) should be defined with the scope of duties and held accountable for their performance, regardless of whether he or she is employed in a managerial or worker position.

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