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THE NECESSITY OF CONSIDERING RECONSTRUCTION-SPECIFIC FEATURES IN CONSTRUCTION ORGANIZATION PROBLEMS

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ABSTRACT

The article discusses issues of reconstruction at industrial enterprises and the conditions of work. A classification of forms of reproduction of fixed assets and conditions of work during reconstruction has been developed. The main reasons making it difficult to carry out work at reconstruction sites have been identified. Factors that increase the labor intensity of reconstruction work have been identified and their classification has been developed depending on the types of reproduction of fixed assets. It is proposed to create a regulatory framework in the form of correction factors for labor losses in order to improve the design of reconstruction organizations.

Keywords: Reconstruction, industrial enterprises, fixed assets reproduction, work conditions, reconstruction challenges, labor intensity factors.

1. INTRODUCTION

The efficiency of construction organizations and other participants in the investment process is usually influenced by the specific features of reconstruction. It is known that the performance of construction and installation work in the conditions of reconstruction of existing industrial enterprises has its own characteristics in contrast to that during new construction. These features are due to the fact that construction and installation work is carried out in close connection with the main work of the enterprise being reconstructed (in existing buildings and structures, in the conditions of the established master plan of the enterprise, etc.).

2. METHODOLOGY

The reconstruction of existing industrial enterprises is characterized by the form of reproduction of fixed assets and the conditions for construction and installation work. As a basis for further research, we have adopted a systematic approach to reconstruction and production conditions as set out in works [1 ÷ 6].

As a result of the research, a classification of forms of reproduction of fixed assets and conditions for the production of construction and installation work during the reconstruction of existing industrial enterprises was proposed; it is shown in Table. 1.

Table 1. Classification of forms of reproduction of fixed assets and conditions for construction and installation work during the reconstruction of existing industrial enterprises

Form of reproduction of fixed assets	Characteristics of conditions for construction and installation work
Construction of new facilities	On the territory of operating enterprises with an extensive network of transport and engineering communications and cramped conditions for storing materials The same, but in particularly cramped conditions for storing building materials
Expansion of existing workshops and their reconstruction with a complete shutdown of the main one production	In buildings free of equipment or other items that interfere with normal work
Reconstruction of existing workshops	Without stopping production

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without stopping the activities of the enterprise and the facilities under construction	When workplaces are particularly cramped with existing equipment If it is impossible to supply workplaces with materials normally If there are operating factory lifts and mobile cranes, unloading buckets, etc. in the work production area. In the presence of periodic movement along intra-shop railway tracks When performing work in existing workshops classified as hazardous, c. including in open areas, when the indoor air temperature is more than 40ºC

From the data in Table 1 it can be seen that construction and installation work at existing enterprises, as a rule, is carried out in cramped conditions of work on a construction site with a developed system of underground and surface communications. Very often, work inside existing workshops is carried out without stopping the main production, in the presence of harmful gases, increased gas pollution, dust, high temperature, etc.

It has been established that the main reasons making it difficult to carry out construction and installation work at reconstruction sites include:

- limited opportunity to use conventional construction machines and mechanisms and at the same time the lack of special mechanization tools suitable for construction and installation work in cramped conditions;
- reduction in prefabrication of construction due to the use, as a rule, of non-standard design solutions; carrying out work to repair or replace individual parts of structural elements of existing buildings and structures;
- the inability to comply with the technological sequence in the execution of work, as well as the lack of conditions that ensure the normal organization of on-site storage facilities and access roads;
- increased unproductive losses of working time of people and construction machines associated with work in operating workshops, the adoption of additional labor protection measures, compliance with the operating hours of the main production, etc.;
- significant dependence of the construction organization's work (as opposed to new construction) on the customer in providing the scope of work;
- frequent changes in design solutions, the need for which is identified during the reconstruction process.

When carrying out reconstruction work, the features of their implementation in the conditions of an existing enterprise must be taken into account, taking into account four groups of features.

The first group of features is associated with the combination in time and territory of the enterprise's technological processes and construction and installation work.

The second group of features is associated with the cramped territory of the enterprise (this refers to the placement of warehouses of materials, parts, structures, equipment, construction machines, temporary buildings and structures on the territory). It is also necessary to take into account the external and internal constraints of the reconstruction object, associated with the possibility of locating large assembly sites, warehouses for structures, parts, materials, crane tracks, mechanization equipment, and road construction near the reconstructed objects.

The third group of features is related to the specifics of performing work in reconstruction conditions.

The fourth group of features is related to the transportation of goods across the territory of the enterprise for reconstruction purposes.

These features, in our opinion, could be divided into only three groups: spatial and temporal limitations, specific technology and organization of reconstruction work.

3. RESULTS

Based on an analysis of literary sources, we have developed a classification of types of reproduction (renewal) of fixed assets and factors influencing the labor intensity of reconstruction work (see Table 2). In accordance with the above classification of various forms of reproduction (renewal) of fixed assets, two types of work are possible: in-shop and on-site.

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Table 2. Classification of types of reproduction of fixed assets and factors influencing the labor intensity of reconstruction work

lassification levels	**Classification characteristics**	**Classification groupings**														
1	Form of reproduction and renewal of fixed assets	1.1. Technical re-equipment	1.2. Reconstruction	1.3. Extension	1.4. New construction on the territory of existing enterprises											
2	Type of work	2.1. In-shop	2.2. On-site													
3	Factors that increase labor intensity	3.1. Spatial limitation of the working area (cramped area in plan and height)	3.2. Time limitation	3.3. Specifics of technology and organization of reconstruction work												
4	Forms of manifestation of factors	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12	4.13	4.14	4.15	4.16
		Complication of technology and organization of construction and installation works	Difficulties in the normal organization of the workplace	Complication with the use and use of existing mechanization means	Difficulties in transport operations	The occurrence of additional work to ensure labor protection	The need to take additional measures to preserve the production environment at reconstructed prices	Complications in the technology and organization of construction and installation works	Changes in the labor regime of construction workers with its subordination to the regime of existing production	Dependence on the customer in providing the scope of work in areas involved in the main production	The need for people and vehicles to comply with access control regulations at the enterprise	Implementation of individual design solutions	Reduced construction prefabrication	Decrease in the level of mechanization of construction	Repair or replacement of individual parts of structural elements of existing buildings and structures	carrying out work to preserve and strengthen the structures of buildings and structures in close proximity to the facility under	Restoration of roads and passages damaged during reconstruction work

Factors that increase the labor intensity of reconstruction work include [2]:

- ✓ spatial limitation of the working area (cramped territory in plan and height), which include: increasing complexity of technology and organization of construction and installation work, difficulties in transport operations, etc.;
- ✓ temporary limitations, which include: a change in the work schedule of construction workers with its subordination to the operating mode of existing production, dependence on the customer in providing the scope of work in areas involved in the main production, etc.;
- ✓ the specifics of the technology and organization of reconstruction work, which include: the implementation of individual design solutions, reducing the level of mechanization of construction and the level of prefabrication, and a number of others.

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4. CONCLUSION

The listed features of the reconstruction of existing industrial enterprises significantly affect the final results of the activities of construction organizations and do not affect the reduction of reconstruction time. In connection with the above, taking into account the peculiarities of the reconstruction of industrial enterprises, it is necessary to create a differentiated regulatory framework in the form of correction factors for losses of labor costs for certain types of work and reconstruction objects, taking into account the conditions of construction production for their use in solving problems of improving the design of organization and construction management.

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