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Iryna Posternak [1]
Serhii Posternak [2]

CSTC T-PPR: ORGANIZATIONAL ACTIONS INCREASE POWER EFFICIENCY RECONSTRUCTION BUILDINGS

[1]The Odessa state academy of building and architecture
[2]Private company "Composite", Odessa

Abstract: *Reconstruction historical building has the big social and economic value. Its primary goals consist not only in prolongation service life buildings, but also in liquidation physical and an obsolescence, improvement conditions residing, equipment residential buildings by the modern engineering equipment, increase operational characteristics and architectural expressiveness. It is offered to create in the city of Odessa "the Corporate scientific and technical complex town-planning power reconstruction "CSTC T-PPR", as innovative organizational structure which uses in practice the saved up scientific and technical potential for reconstruction of buildings of historical building of Odessa under standards power efficiency. The considered method of calculation building stream M-CUR possesses positive property an effective utilization of cost labor and machine resources, at their considerable (defining duration of works) costs; however thus there are breaks in development of separate private fronts of works.*

Key words: an operational administration building; scheduling; the building organization; a corporate scientific and technical complex; town-planning power reconstruction.

World practice shows, that increase power efficiency is reached mostly at the expense of organizational changes in a guidance system power economy the enterprises or cities. Having introduced system power management it is possible to reach without the big financial losses considerable energy conservation in 3…5% for 1…2 years. Power management includes a set of the actions aimed at economy power resources: monitoring power consumption, working out power budgets, the analysis existing indicators as bases drawing up new budgets, working out a power policy, mapping out new power savings actions etc. Power efficiency building – property of a building, its structural components and plumbing system to provide during expected life cycle this building household requirements the person and optimum microclimatic conditions for its stay in premises such building at is standard-admissible (optimum) expenses power resources for heating, illumination, fanning, an air conditioning, heating of water taking into account a climatic conditions [1].

In town-planning is shown the tendency to integration, both in sphere production of goods, and in management sphere; the expanded reproduction demands the further increase level a division of labor, concentration and specialization of building manufacture, an intensification exchange of results is industrial-economic activities. As one of perspective forms integration various complexes act in town-planning structure; in the course formation plans social and economic development of large cities even more often there is a situation when for increase of efficiency used financial, material and a manpower concentration of efforts, but also new progressive forms the organization of building manufacture – corporate, scientific and technical is necessary not simply, power efficiency [2…4].

Line methods organization works can be calculated in the different ways therefore they have received names of methods calculation organization works. We will consider a method continuous use of resources (M-CUR).

For calculation formation streams on method M-CUR we will consider the line organization of works presented by matrix durations and the schedule internal painting and decorating, at reconstruction buildings of historical building Odessa under standards power efficiency (tab. 1).

On four building objects (buildings of historical building Odessa), defined as private fronts of works, are carried out four kinds of works in rigid technological sequence (A→B→C→D) on each object: plaster works (index A), priming works (index B), under paint putty works (index C) and works on colorings (index D). The sequence development private fronts works also is fixed by the following sequence: 1→2→3→4.

Each kind of work is carried out by constant cast which pass to the following object only after the full termination work on previous object. If the given complex works was carried out by a consecutive method its minimum duration would be equal to the sum of durations all works entering into a given complex:

T = 7+9+6+8+2+3+2+3+13+17+11+15+5+8+4+6 = 119days.

Table 1

Matrix durations and the schedule painting and decorating calculated by a method continuous use resources

Index and the name of works	Private front of work				Total duration of work
	I	II	III	IV	
A. Plaster works	0 7 7	7 16 9	16 22 6	22 30 8	30=7+9+6+8
B. Priming works	23 25 2	25 28 3	28 30 2	30 33 3	T_B^w = 23 10=2+3+2+3
C. Under paint putty works	25 38 13	38 55 17	55 66 11	66 81 15	T_C^w = 2 56=13+17+11+15
D. Works on coloring	64 69 5	69 77 8	77 81 4	81 87 6	T_D^w= 39 23=5+8+4+6
Total durations of fronts of works	69=69–0 27= 7+2+13+5 42=69–27	70=77–7 37= 9+3+17+8 33=70–37	65=81–16 23= 6+2+11+4 42=65–23	65=87–22 32= 8+3+15+6 33=65–32	Stretching of communications frontal – 150

Source: It is developed by authors on the basis scheduling.

For the line organization works at performance any work on any object performance two obligatory conditions is required:

1) the termination the given kind of work a resource on previous object (resource readiness of executors);

2) the termination a previous kind of work on the given object (technological readiness private front of work).

In the centre of each element tab. 1 values duration works in days are shown. At formation of schedules works the primary goal consists in calculation terms manufacture works or, otherwise, terms the beginnings and the terminations works.

For the given stream (tab. 1) as restriction maintenance of continuous performance of each kind of work (a zero stretching of resource communications), and as criterion function – the greatest possible rapprochement of adjacent kinds of works (private streams) is entered.

For a conclusion of the basic settlement formulas the size carrying the name of the period expansion which defines a difference between the beginning of the subsequent work on private front I and the beginning of previous work on the same front – T^w_{i+1} is entered into consideration. Clearly that the first work in a technological order is not preceded by any other work and its beginning is accepted by the zero. Thus, having defined the beginning of the first work and the corresponding period of expansion of the second work, it is possible to calculate the beginning of its manufacture on private front I etc. (on an induction) before definition of the beginning last kind of work.

Having calculated the beginning last work taking into account restriction on continuity of performance works, it is possible to define the general duration all complex of works under the formula (1):

$$T = \sum_{i=1}^{m-1} T_{i+1}^{w} + \sum_{j=1}^{n} t_{m,j} \ , \qquad (1)$$

where T^w_{i+1} – the period of expansion the subsequent work; m – the general number of kinds works (a current serial index, i); n – the general number of fronts works (a current serial index, j); $t_{m,j}$ – duration of last kind work on j-м front.

For definition of values the periods of expansion subsequent works we will take advantage of a condition (2) at which prior to the beginning of any simple work previous work by the form on the same private front should be executed:

$$T_{i+1}^{w} = \max_{j=1,n} \sum_{k=1}^{j} \left(t_{i,k} - t_{i+1,k-1} \right), \tag{2}$$

where $t_{i+1,0}$ – operation time on zero front is equal to zero.

Let's take advantage the previous formula (2) and we will define the periods expansion works B, C and D, shown by following formulas (3):

$$\begin{aligned}
T_B^w &= \max\begin{Bmatrix} 7-0=7 \\ 7+9-0-2=14 \\ 7+9+6-0-2-3=17 \\ 7+9+6+8-0-2-3-2=23 \end{Bmatrix} = 23; \\
T_C^w &= \max\begin{Bmatrix} 2-0=2 \\ 2+3-0-13=-8 \\ 2+3+2-0-13-17=-23 \\ 2+3+2+3-0-13-17-11=-31 \end{Bmatrix} = 2; \\
T_D^w &= \max\begin{Bmatrix} 13-0=13 \\ 13+17-0-5=25 \\ 13+17+11-0-5-8=28 \\ 13+17+11+15-0-5-8-4=39 \end{Bmatrix} = 39.
\end{aligned} \tag{3}$$

Conclusion: reconstruction historical building has the big social and economic value. Its primary goals consist not only in prolongation service life buildings, but also in liquidation physical and an obsolescence, improvement conditions residing, equipment residential buildings by the modern engineering equipment, increase operational characteristics and architectural expressiveness. It is offered to create in the city Odessa "the corporate scientific and technical complex town-planning power reconstruction "CSTC T-PPR", as the innovative organizational structure using in practice the saved up scientific and technical potential for reconstruction buildings historical building of Odessa under standards power efficiency. The considered method of calculation building stream M-CUR possesses positive property of an effective utilization cost labor and machine resources, at their considerable (defining duration of works) costs; however there are breaks in development separate private fronts of works.

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Posternak Iryna M. **–** PhD in Technical Sciences, Associate Professor, the Associate Professor of Department of the Organization of Building the Odessa state academy of building and architecture, e-mail: posternak.i@gmail.com

Posternak Serhii A. **–** PhD in Technical Sciences, Associate Professor private company "Composite", Odessa, e-mail: icomos.rur@gmail.com