

Improving programs for capital repairs of apartment buildings and their role in the sustainability of the region

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Abstract. The current state of the housing stock of the Russian Federation necessitates overhaul of the common property of apartment buildings. The basis of the state program (concept) for overhaul of apartment buildings is formed by regional programs and short-term plans for overhaul of the common property of apartment buildings. Therefore, the purpose of this article was to study the implementation of the regional program for the overhaul of apartment buildings and develop directions for its improvement. The subject of the research is the regional program for the overhaul of the common property of apartment buildings in the Volgograd region, which is a document that guarantees the overhaul within the time frame established in it. The analysis of the implementation of the program according to the data of the Fund For Overhaul of the Volgograd region is presented. The problems of the implementation of the regional program are identified and directions for their elimination are outlined, which will allow achieving the target indicators of the regional overhaul program.

Keywords. Apartment building, regional overhaul program, tariff for overhaul, defect list, electronic passports of the technical condition of apartment buildings.

1 Introduction

The important indicator of the socio-economic development of a region is the level of satisfaction of its population with housing conditions. Satisfaction depends on many factors, from the availability of the housing itself, to receiving quality services for its maintenance and restoration. Russia's aspiration for European standards of quality of life requires a revision of approaches to the formation of regional housing policy, primarily to the system of housing stock management, focused on its preservation and reproduction. The housing stock of the Russian Federation has a high degree of deterioration, low energy efficiency indicators that do not match technical maintenance standards, it leads to an overestimation of energy consumption. In such conditions, it is relevant to improve the formation and

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implementation of regional programs for overhaul of the housing stock and the development of methodological provisions for determining its cost.

In order to maintain the housing stock of the Russian Federation in a condition suitable for safe and comfortable living of citizens, the systematic overhaul is necessary. The need for overhaul arises more than once, individual structural elements of the building have their own deterioration resource, therefore, there is a need for financial investments for their repair and restoration with a certain frequency. It was decided to eliminate the problem of underfunding of overhaul of apartment buildings by means of compulsory financial participation of the owners. It became possible after significant amendments were made to federal legislation in 2012, including the Housing Code of the Russian Federation. The new procedure and terms of financing makes it possible to recognize payment for overhaul as mandatory for all owners. And the creation of a clear mechanism made it possible to carry out overhaul of the total housing stock in a planned manner [1-3].

There was a need to create long-term programs for overhaul of apartment buildings. The proclamation at the federal level of a large-scale long-term program for overhaul of the housing stock should be considered a huge achievement of the state authorities of the Russian Federation.

Research in the field of energy-saving technologies for the solution of overhaul programs was carried out in the work by A.I. Romanova, A.V. Berval, D.O. Burkeev, R.S. Safina, E.V. Ilyina, D.A. Egorov [4] and implementation of programs for the reproduction of the housing stock [5].

In a relatively short time, a strategy for the implementation of this program was determined, a legislative and regulatory framework was created.

The state program (concept) is based on regional programs and short-term plans for overhaul of the common property of apartment buildings.

Regional overhaul programs include:

- overhaul planning for each apartment building;
- organization of targeted financing from all sources, including state and municipal support funds, owners' funds; financing the cost of providing subsidies to low-income citizens;
- organization of the infrastructure work – a regional operator of overhaul, ensuring the collection of targeted funds and the organization of overhaul of apartment buildings [6].

The regional program (long-term plan) for overhaul in the Volgograd region was approved by the decree of the Government of the Volgograd region of December 31, 2013 N 812-p «On approval of the regional program «The overhaul of common property in apartment buildings located in the Volgograd region» (as amended on July 10, 2020).

2 Materials and methods

As part of the implementation of the regional program, since 2014, 1329 apartment blocks have been repaired, which made it possible to improve living conditions for 125.05 thousand residents. During this period, the Fund spent 6186.804 million rubles for overhaul.

The long-term regional program for the overhaul of apartment buildings, as of 01.01.2021, included 10953 houses.

Additionally, 76 apartment buildings were included in the long-term regional overhaul program, of which:

- 66 apartment buildings – are newly commissioned;
- 8 apartment buildings – are previously not included in the regional program;
- 2 apartment buildings – there are canceled decisions on recognizing apartment buildings as emergency and subject to demolition.

In 2020, the Fund continued to work on filling the State Housing and Utilities Information System with data. At the present time, there is uploaded information about the regional operator, the regional program, short-term plans for its implementation, tariffs, accounts and

special accounts owned by the regional operator, personal accounts of the owners of premises, receipts for contributions for overhaul and other information that increases the transparency of the regional operator’s activities [7-9].

Today, more than 80% of owners form the overhaul fund on the account of a regional operator.

At the same time, the minimum tariff on contributions for overhaul in the Volgograd region continues to be one of the lowest in the Southern Federal District. In addition, in the Volgograd region, a number of preferential categories of citizens have been determined who have the right to receive compensation for contributions paid for overhaul in a declarative order (Fig. 1).

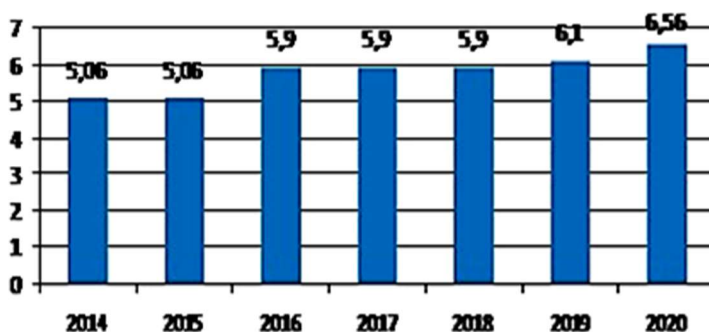


Fig. 1. The dynamics of overhaul tariffs in the Volgograd region for 2015-2020 year (rub/m).

In order to improve payment discipline, there is the explanatory work with the population of the Volgograd region through mass media about the need to pay contributions for overhaul of the mass media. As a result, the level of collection of contributions showed an increasing dynamics.

So, as of the end of 2014, the amount of fundraising was just over 10%, in 2015 – 50%, in 2016 – 82%, in 2017 – 87.6%, in 2018 – 92.3%, in 2019 – 89% (Fig. 2).

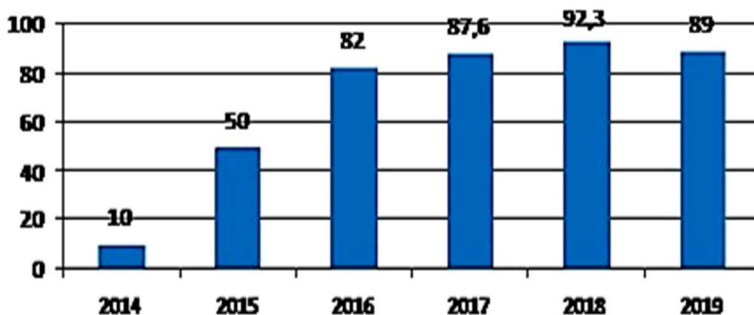


Fig. 2. The dynamics of collected contributions for overhaul in the Volgograd region (the percentage of collected contributions for 2014-2019 year).

One of the main reasons for the decrease in the collection compared to 2018 is the inclusion of apartment buildings with over 70% depreciation in the program in January 2019 - the collection rate for such buildings is only 53%. The owners of common property in these buildings refuse to pay contributions, referring the emergency state of their buildings. The indebtedness of these owners is 5.3 million rubles. It was the main reason for the increase in overhaul contributions.

In order to fulfill the regional short-term plan for the implementation of the regional program for 2020, the Unitary Non-Profit Organization «Regional Fund for Overhaul» concluded:

- 204 contracts for the overhaul of common property in apartment buildings in the amount of 1 439 933 716 rub.;

- 70 contracts for the provision of services and (or) performance of work on the development of design and estimate documentation for the performance of overhaul work in the amount of 117 130 971 rub.;

- 6 contracts for the provision of services and (or) performance of work on the development of design and estimate documentation for the replacement of elevator equipment (elevator), performance of work on replacement of elevator equipment (elevator) in an apartment building in the amount of 388723028 rub. [10];

- 44 contracts for the provision of services for the implementation of construction control over the execution of work on the overhaul of common property for a total amount of 23183205 rub.

677 apartment buildings were subject to repair by the regional operator in 2020, of which as of January 2021:

- 556 apartment buildings – work performed for the amount of 1.8 billion rubles (including 136 apartment buildings, where construction and installation work was completed, with the exception of the gas supply system, that did not allow to fully show the house in the report).

Of the remaining 121 apartment buildings:

- 63 apartment buildings work is underway with completion until 04.30.2021:

- 15 apartment buildings – based on the results of engineering surveys, the need for construction and installation work was established, the work will be completed in 2021;

- 43 apartment buildings – repair of foundations and gas supply is envisaged, auctions have been repeatedly declared invalid due to the lack of participants, the work will be completed in 2021;

Reasons for not fulfilling plans:

- violation of the deadlines for the performance of work by contractors (50 apartment buildings),

- termination of contracts with unscrupulous contractors and holding a new auction (6 apartment buildings);

- recognition of a previously concluded agreement for the replacement of elevators as invalid, as a result – a new auction (3 apartment buildings);

- identification of the need for instrumental inspection of buildings (55 apartment buildings);

- failure to perform work on the repair of gas supply systems (150 apartment buildings) is due to the presentation by JSC «Volgogradgorgaz» of requirements for the need to install gas contamination alarms for methane and carbon monoxide in the premises of the owners' apartments during the overhaul of gas supply systems, that cannot be performed by the regional operator due to the fact that the data gas signaling alarms do not belong to the common property of the owners and cannot be installed due to the minimum amount of the contribution.

The most important task, which is currently supplied by the Government of the Russian Federation, is the replacement of elevator equipment, the service life of which is more than 25 years. In accordance with the requirements of the technical regulations of the Customs Community TR TS 011/2011 «Safety of elevators», these elevators must be replaced by 2025.

In total, since 2015, 659 units of elevator equipment have been replaced in the Volgograd Region in 157 apartment blocks for the amount of 1.1 billion rubles, of which:

- in 2015-2016 – 20 elevators were replaced in 13 apartment buildings for the amount of 32.1 million rubles. Measures to replace elevator equipment were carried out within the framework of the state program of the Volgograd region, approved by the decree of the

Volgograd region Administration dated February 20, 2016 No. 56-p, on the basis of a co-financing mechanism;

- from 2017 to 2020 – within the framework of the regional implementation of the program, at the expense of the overhaul fund, formed from the minimum contribution, 639 elevators were replaced and accepted by the Fund in 172 apartment buildings in the amount of 1.02 billion rubles.

Currently, the Fund has prepared proposals for the replacement of elevator equipment until 2025 with a possible payment by installments.

3 Results and discussions

As a result of the study about the implementation of overhaul program of the common property of apartment buildings, the following problems can be identified.

Legal illiteracy of the population. Not every person can independently study all the intricacies of the legislation concerning the application of the rules of law, the existing procedure for the overhaul of common property. Ignorance of the law makes it impossible to apply it correctly, including the participation of citizens in the choice of the method of accumulating contributions for overhaul, the possibility of acceptance by the owners of premises in an apartment building after the overhaul. Citizens often do not know where to ask with relevant questions, that they have the right to influence. The owners do not always have the necessary knowledge of the production technology, construction and legislative norms.

The problem of collecting contributions for overhaul. The essence of the overhaul contribution is not a payment for a service, but the formation of a fund from which overhaul work is financed. A regional operator cannot use more than 95% of the owners' funds actually collected for the previous year. Thus, the low collection of contributions inhibits the implementation of the overhaul program, does not make it possible to finance the program work, that does not allow bringing the housing stock of the region into proper condition with an acceptable level of improvement and comfort of housing.

The problem of keeping money in the Regional Operator's Fund. The money collected by the Fund in the form of contributions from the owners of apartment buildings before their practical use for repairing apartment buildings is devalued by inflation. It is also one of the complaints that citizens have against the overhaul program.

Defective repair lists are often biased.

A defect list is a special document that allows to calculate and take into account in advance the costs that must be spent on repairs in order to restore the original appearance and characteristics of material values [11, 12]. The defect list is made after a visual inspection (technical inspection) of the structural elements of apartment buildings, it must reflect all types of work that must be performed to restore the building's operability. The types of work should be as detailed as possible, the accessories and brands of materials, the conditions for the production of work, and their volumes are indicated. In the future, the defect list is used to make an estimate for the repair and restoration work. However, defect lists often are not compiled in full, i.e. does not reflect the full scope of work. The estimator, making an estimate for a given object on the basis of a defect list, does not see the real object, and also does not plan this type of work, does not make provisions of money [12, 14].

Problems of choosing contractors. In order to organize work on the selection of contractors on a competitive basis, contractors for overhaul works are selected through an open tender.

The contractor participating in the tender procedures must show the quality of its work and the timeliness of its implementation, because the price of the work is a less significant factor in the evaluation of the winner of the competition [15].

The impossibility of simultaneously bringing the common property of all apartment buildings requiring priority overhaul work to a standardized state. About half of the apartment buildings included in the regional program of the Volgograd region require priority work. The program of overhaul of apartment buildings is built by years, and the planned term of work on the types of structural elements of the building often exceeds the standard service life of the elements. The wish of residents to renovate their apartment building earlier than the year established in the program does not coincide with the possibility of the program.

Electronic passports reflecting the technical condition of the apartment buildings and affecting the sequence of the overhaul are not fully filled out.

According to the current legislation, the owner must conduct a technical inventory of a residential building. This service is paid, and work on the technical inventory of apartment buildings currently in Volgograd costs from 60 to 80 thousand rubles, depending on the number of storeys of the building. Carrying out inventory work on a centralized basis is impossible due to lack of funds. Therefore, management companies fill out an electronic passport by visual inspection, and the deterioration of apartment building structures is not included in the electronic passport. The program cannot correctly calculate the timing of the overhaul of the structural elements of apartment buildings .

To structure the problem, we will conduct an additional study of the identified problems and formulate a set of business proposals for their solution.

To improve legal literacy, it is necessary to carry out constant information and explanatory work with the population and local authorities about the new system of overhaul, about the methods of forming the overhaul fund, about the consequences of choosing any method of accumulating funds [16-18].

The regional operator should actively work to inform citizens about the organization of overhaul of the common property of apartment buildings, included in the short-term overhaul plan for the current and subsequent years. For this, it is necessary to organize public hearings, visits of specialists to the municipal districts of the region. It is not fulfilled the obligation to notify the owners of the apartment buildings about the upcoming overhaul, about the date of acceptance of the overhaul works .

The regional administration is actively involved in the project «School of the competent consumer» of the «United Russia» party, it educates citizens in the field of housing and communal services. In 2020, within the framework of this project, 78 training seminars were held, information materials and booklets were published [19, 20].

For better collection of contributions for overhaul, the regional operator needs to carry out work on the timely identification, collection and repayment of receivables, as well as to develop a specific mechanism of action to work with debtors in the pre-trial and judicial proceedings.

The proposed actions for working with debtors should be as follows: sending a claim to the debtor about the problem of repayment of receivables on a voluntary basis. Conclusion with the debtor of an agreement on an installment plan for the repayment of arrears in payment of contributions for overhaul with timely current payments. Sending pre-trial warnings to defaulters. Sending a statement of claim to the courts of the Volgograd region to recover the resulting debt. The decision-making on debt collection and issuance of a writ of execution judicially. Public awareness of the visible positive results of the implementation of the regional overhaul program also has a positive impact on the collection of contributions. The consequence of the implementation of high-quality and effective overhaul is to improve the confidence of the owners of premises in the apartment building to the regional program, that contributes to an increase in the collection of contributions [21, 22].

The problem of money depreciation can be partially solved by placing temporary balances of funds in accounts with a minimum account balance and a relatively high interest on the

account (8-10%), with a maturity of 30 to 181 days. Additional funds received from account transactions should also be used for overhaul.

A correctly drawn up and sufficiently detailed defective list is a necessary element of the technological overhaul process. The list of defects is compiled on the basis of an act of technical inspection, survey. Technical inspection is carried out by organizations that have the necessary means of technical diagnostics, regulatory and technical documentation for the control and assessment of structures, and also have trained specialists. The preparation of a defective list should be entrusted to highly qualified specialists with significant practical experience in the repair and operation of buildings and structures. In the absence of employees with the necessary knowledge, it is worth attracting an expert organization specializing in this activity.

In order to prevent unscrupulous contractors from the market of overhaul of apartment buildings in the region, in 2015, the main provisions were introduced into the law of the Volgograd region of April 24, 2015 N 46-OD «On the procedure for attracting contractors by a regional operator to provide services and (or) perform work on overhaul of common property in apartment buildings». It concerns the criteria for scoring applications, including additional points to participant who was registered in the Volgograd region, for increasing the five-year guarantee period.

To resolve the problem of the lack of applications from contractors for the tender for overhaul of in-house engineering networks, the authors of the article propose to attract management companies for these works. The advantage of providing overhaul works of in-house engineering networks to management companies is that they usually have specialists working with engineering networks in apartment buildings as part of current repairs, who know from experience the weak points of engineering systems of apartment buildings (engineers, locksmiths, electricians). Further maintenance by the same management companies of in-house engineering networks of apartment buildings after overhaul should ensure a responsible attitude of the management companies to the quality of work.

By order of the Ministry of Construction of Russia No. 82/pr. Of February 17, 2016, the forms of the electronic passport for an apartment building and a residential building were approved, as well as forms of the electronic document about the state of utility and engineering infrastructure facilities. These forms are placed in the open part of the state information system of housing and communal services. Electronic passports of an apartment building, electronic passports of a residential building, electronic documents about the state of utility and engineering infrastructure facilities are generated in an automated mode from the information contained in the system at the time of the request for the formation of a corresponding electronic passport or electronic document in the system. So, new forms of the electronic passport should be formed on the basis of the information that was entered into the information resource earlier [23, 24].

The completeness of the information entered into electronic passports depends on the qualifications and attention of the specialist of the management company managing the homeowners association. The owners of residential premises of apartment buildings have the right to require management companies to fully enter information in electronic passports.

4 Conclusions

1. It has been established that the current rate of overhaul does not match the needs of society. When implementing a system for managing overhaul of apartment buildings on the basis of mandatory payments, there are contradictions due to the need to accumulate funds in a short time in sufficient volumes for overhaul and the low solvency of significant groups of the population.

2. The indicators of the budgetary provision of the regional program are unacceptably low, it jeopardizes the implementation of the regional program and short-term plans for overhaul of the common property of apartment buildings in connection with the arrears in payments for overhaul of the owners of premises in apartment buildings, which are in municipal, regional and federal ownership.

3. Improving the efficiency of overhaul should be based on reliable data about the actual technical condition of overhaul facilities, which makes it possible to determine the necessary and sufficient list of types of work, their volume and cost. It will make it possible to develop programs that not only take into account the specifics and degree of depreciation of the housing stock of the region, but also to plan and balance resource provision. It will allow achieving the target indicators of the regional program for the overhaul of the common property of apartment buildings.

References

1. G. Borshchevskiy. *Ex-post evaluation of regional bureaucracy development programs*, Voprosy Ekonomiki **1**, (2018). DOI: 10.32609/0042-8736-2018-1-45-70.
2. V. Chernykh. *Main Directions of Perspective Social and Economic Development of the Mari El*, Studies on Russian Economic Development **31** (4), (2020). DOI: 10.1134/S1075700720040048.
3. O. Ilyash, S. Hrynkevych, L. Ilich, S. Kozlovskiy, N. Buhaichuk. *Economic assessment of the relationship between housing and communal infrastructure development factors and population quality of life in Ukraine*, Montenegrin Journal of Economics **16** (3), (2020). DOI: 10.14254/1800-5845/2020.16-3.8.
4. A.I. Romanova, A.V. Berval, D.O. Burkeev, R.S. Safina, E.V. Ilyina, D.A. Egorov. *Evaluation of savings on operational services from innovative energy-saving materials*, IOP Conference Series: Materials Science and Engineering. International Scientific Conference Interstroyemh, 012029 (2020). DOI: 10.1088/1757-899X/786/1/012029.
5. A.I. Romanova. *Private investors cash accumulation method within the framework of realization of residential fund reproduction programs and payment for housing and communal services*, Izvestija KSUAE **3** (17), 235 (2011).
6. O. Antonyan, O. Maksimchuk, A. Solovyova, A Chub. *The formation of the cost of overhaul of apartment buildings in the budget of the region*, 2nd Volgograd-State-University International Scientific Conference on Competitive, Sustainable and Safe Development of the Regional Economy (CSSDRE) (2019). DOI: 10.2991/cssdre-19.2019.28.
7. O. Bakhareva. *Strategic planning of infrastructure development: BIM and intelligent building*, Journal of Advanced Research in Law and Economics **10** (8), (2019). DOI: 10.14505/jarle.v10.8(46).04.
8. Y. Farinyuk, A. Glebova, K. Kotelnikov. *The Estimation of Factor Activity of the Productive Forces of the Region*, Studies in Systems, Decision and Control **282**, (2020). DOI: 10.1007/978-3-030-44703-8_18.
9. V. Grebennikov, B. Yerznkyan, R. Magomedov. *Governmental programming of regional budgetary self-sufficiency*, Montenegrin Journal of Economics **16** (2), (2020). DOI: 10.14254/1800-5845/2020.16-2.16.
10. O. Antonyan, E. Karpushko, A. Solovyeva. *Problems of modernization and technical re-equipment of Russian machine-building enterprises*, MATEC Web of Conferences **129**, 01022 (2017). DOI: 10.1051/matecon/201712901022.

11. S. Akmam Syed Zakaria, T. Gajendran, M. Skitmore, G. Brewer. *Key factors influencing the decision to adopt industrialised building systems technology in the Malaysian construction industry: an inter-project perspective*, Architectural Engineering and Design Management **14** (1-2), (2018). DOI: 10.1080/17452007.2017.1298512.
12. V. Timiryanova, A. Zimin, E. Zhilina. *The spatial change of the indicators of consumer market*, Economy of Region **14** (1), (2018). DOI: 10.17059/2018-1-13.
13. X. Cai. *Determinants of affordable housing allocation: Common perspectives from local officials*, Regional Science Inquiry **10** (2), (2018).
14. Q. He, M. Hossain, S. Ng, M. Skitmore, G. Augenbroe. *A cost-effective building retrofit decision-making model – Example of China's temperate and mixed climate zones*, Journal of Cleaner Production **280**, 124370 (2021). DOI: 10.1016/j.jclepro.2020.124370.
15. N. Gareeva, A. Starodubova, A. Romanova. *The region's competitiveness assessment on the basis of «sustainable development» concept*, IOP Conference Series: Materials Science and Engineering **890** (1), (2020) DOI: 10.1088/1757-899X/890/1/012189.
16. H. Karimi, T. Taylor, G. Dadi, P. Goodrum, C. Srinivasan. *Impact of Skilled Labor Availability on Construction Project Cost Performance*, Journal of Construction Engineering and Management **144** (7), (2018). DOI: 10.1061/(ASCE)CO.1943-7862.0001512.
17. P. Kornilov, D. Lapaev, O. Lapaeva. *Housing innovation management: Strategic directions of development*, International Journal of Management **11** (5), (2020).
18. N. Kosinova, M. Tolstel, A. Chekalkina, *Comprehensive evaluation of investment potential (the case of the Southern Federal District)*, Asian Social Science **10** (23), (2014). DOI: 10.5539/ass.v10n23p231.
19. A. Kulik, N. Gerasimova, Y. Bondareva, A. Kogteva, N. Borzenkova. *Implementation of the regional investment project of energy efficiency increase of the enterprise of Belgorod (According to Belvodokanal GUP)*, International Journal of Energy Economics and Policy **7** (2), (2017).
20. E. Shagiakhmetova, O. Borovskikh, A. Nizamova, T. Kazymova. *Multivariate model of construction project operational efficiency*, IOP Conference Series: Materials Science and Engineering **890** (1), (2020). DOI: 10.1088/1757-899X/890/1/012113.
21. G. Kalkabayeva, A. Rakhmetova, M. Assanova. *Financing of eco-innovations: Sources and trends in Kazakhstan*, International Journal of Energy Economics and Policy **11** (1), (2021). DOI: 10.32479/ijeep.10762.
22. D. Martin, A. Gustafsson, S. Choi. *Service innovation, renewal, and adoption/rejection in dynamic global contexts*, Journal of Business Research **69** (7), (2016).
23. I. Masakova. *The Russian Practice of Compiling Input-Output Tables: Problems and Prospects of Development*, Studies on Russian Economic Development **30** (2), (2019). DOI: 10.1134/S1075700719020126.
24. H. Xue, S. Zhang, Y. Su, Z. Wu, R. Yang. *Effect of stakeholder collaborative management on off-site construction cost performance*, Journal of Cleaner Production **184**, (2018). DOI: 10.1016/j.jclepro.2018.02.258.