
LIABILITY OF CONSTRUCTION PARTICIPANTS FOR DELAYS

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Abstract. Date of completion is usually set forth in construction contract agreements as one of the most important provisions. Also, it is the provision, which is often violated and the violation results in a dispute between the parties to the agreement. Analysis of research literature has revealed that most authors analyse and identify causes of delays in construction as well as recommend delay analysis methods omitting or underemphasising the liability of the parties to construction contract agreements for violation of construction completion date. One more problem in this area is the difficulty in applying practices of different countries in a specific country due to differences in legislative frameworks. Cases described in research literature are often idealised, while realistic construction projects frequently possess various specific features. This article aims at identifying problems faced when assessing the liability of construction participants for violation of completion date and suggesting ways to handle the problem.

Keywords: delay, bar diagram/Gantt chart, CPM, damages, penalty.

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1. Introduction

Construction projects are always specific, as their implementation always requires a lot of different organisational activities. Construction projects (design documentation) usually require large investment and strict control of processes, finance and quality. Construction operations often pose a threat to human health. In addition, even construction of small installations requires subcontractors' involvement. Therefore, very strict safety and quality control as well as precise scheduling of operations and time limits are a must (Lock 2007; Dilworth 1992).

When the owner decides what to build, it is necessary to choose who should perform these tasks. N. Banaitienė and A. Banaitis (2006) investigate issues of contractors' qualification. Z. Turskis (2008) proposed a multi-criteria method for selection of contractors. Once the contractor is selected, we can conclude a contract for construction, with the key

aspects of cooperation between the parties. Elzbieta Radziszewska-Zielina (2010) has conducted a research on cooperation of partners in construction industry. Sigitas Mitkus and Eva Trinkūnienė (2007, 2008) examined the possible options for construction contracts, the building process and the proposed assessment system. Laura Kaleininkaitė and Ingrida Trumpaitė (2007) proposed the integrated risk management model. Various disputes between parties occur in construction. The behaviour of contractual parties resolving construction disputes was analyzed by Violeta Keršulienė (2007). Defects of construction works and products, and liabilities arising therein, are a frequent cause of disputes in construction, investigated by Sigitas Mitkus (2004).

Litigations for construction delays often occur between construction participants. Deniz Türsel Eliyi, Aslihan Gizem Korkmaz and Abdullah Ercüment Cicek (2009) examined a problem of variable job scheduling. Tomasz Blaszczyk and Maciej Nowak (2009) analyzed the problem of project planning, alignment of the project implementation time and costs, and proposed a new methodology based on computer simulations and the interactive approach. Causes of delay in construction projects have been surveyed by Sadi A. Assaf and Sadiq Al-Hejji (2006). Proposals on identification of causes of construction delays in traditional contracts in Jordan have been outlined by Abdalla M. Odeh and Hussien T. Battaineh (2002). Causes and effects of delays in Malaysian construction industry have been addressed by Murali Sambasivan and Yau Wen Soon (2007). They have identified 10 most important causes of delay from a list of 26 different causes and 6 different effects of delay. Essam K. Zanelidin (2006) has conducted a research on delay-related construction claims in the United Arab Emirates and presented recommendations on how to reduce/prevent claims in the construction sector. David Ardit and Thanat Pattanakitchamroon (2006) have discussed delay analysis methods and posted recommendations on how to select a situation-specific method. Chih-Kuei Kao and Jyh-Bin Yang (2009) have identified the windows analysis method as the most precise delay analysis method, and recommended findings of their research as being useful for analysts addressing delays in construction. G. Sweis, R. Sweis, A. Abu Hammad and A. Shboul (2008) found that the most important cause of delay is financing, while weather conditions, changes in authorities and laws, as delay factors, are ranked lower.

Most authors analyse and identify causes of delays in construction as well as recommend delay analysis methods omitting or underemphasising the liability of the parties to construction contract agreements for violation of the construction completion date. One more problem in this area is the difficulty in applying practices of different countries in a specific country due to differences in legislative framework. Cases described in research literature are often idealised, while realistic construction projects often possess various specific features. This article aims at identifying problems faced when assessing the liability of construction participants for violation of the construction completion date and suggesting ways to handle the problem. In this research, specific problems are identified on the basis of realistic cases of delays in construction.

2. Construction scheduling methods

In order to assess whether the construction completion date has been violated, the diagram/chart that demonstrates scheduling of construction works should be analysed first of all. Construction works are scheduled on the basis of the deadline fixed in the contract for the completion of construction or its component, the volume of construction works and available production capacity. Scheduling of construction projects is more realistic when likely hindrances are taken into account. Such hindrances may be directly dependent on a client, contractor or other construction participants, or be unforeseen (Zavadskas *et al.* 2009).

The main project planning/scheduling methods used in construction projects are as follows:

- bar diagram (Gantt chart, linear chart);
- flow diagram and
- network diagram.

2.1. The use of a bar diagram for project planning

A bar diagram is a textual-graphical tool presented in the form of a table. It can be divided into two parts: calculated parameters and time scale. The first part contains information on the volume of anticipated construction activities/tasks, labour costs, composition of construction team and time of activities expressed in figures. In the second part of the diagram, the duration of activities/processes is presented graphically in a time scale as a certain bar, which length is proportionate to the duration of works, i.e. the beginning of the bar indicates a calendar start date and the end of the bar indicates a calendar end date for works (Fig. 1) (Zavadskas *et al.* 2009; Būda, Chmieliauskas 2006).

No.	Activity/task	Duration in days	Months											
			Days											
1	First activity	1	■											
2	Second activity	2		■	■									
3	Third activity	4			■	■	■	■						
4	Fourth activity	4					■	■	■	■				
5	Fifth activity	3									■	■	■	
6	Sixth activity	3										■	■	

Fig. 1. Simplified bar diagram (model) (Source: Zavadskas *et al.* 2009)

Bar diagrams are widely used in constructions for easy display of activities/tasks and clear linkage with certain time for their completion. Being graphic and easy to understand, bar diagrams used to be the only activity scheduling method for a long time.

Bar diagrams are still widely used in modern practices but, due to quite many defects, rather as supplementing other diagrams/charts (Абрамов, Манаенкова 1990).

Without using relevant software (which is usually the case in Lithuania) for drawing bar diagrams, the main problem arises in analysis of the bar diagram as it does not allow measuring the impact of one or several delays on the subsequent construction works and the overall duration of construction. In addition, it is difficult to identify the most important activities that must be given the primary attention of a construction manager and that have effects on the overall duration of the construction; it is often impossible to identify progress of works/processes at each moment of time, i.e. the existence and span of a delay or advancement in construction.

2.2. The use of a flow diagram for project planning

A flow diagram is used in construction of a number of similar buildings, floors and/or sections. In case of the flow diagram technique, each construction team is responsible for its respective portion of activities/tasks, which can be numerous. A construction team starts with its portion of tasks in the first building/floor/section (out of several identical ones) and, after finishing the task, moves to another building/floor/section to perform the same activities/tasks there. In the first building/floor/section, the first construction team is replaced by the second one, which performs operations delegated to it and, after completion thereof, moves to the second building/floor/section where the first construction team is supposed to have completed its operations (and the site is ready for the second construction team) and moved to the third building/floor/section. Basing on this principle, operations are continued until the last construction team completes its operations in the last building/floor/section (Абрамов, Манаенкова 1990).

A flow diagram enables synchronisation of several activities/tasks. Likewise, it means uninterrupted work, use of building materials and technical resources (Zavadskas *et al.* 2009). The main bottleneck of this method is occasional difficulties to ensure uninterrupted flows of materials and machinery. In addition, any delays in operations in one building/floor/section may impact on construction commencement and completion dates in all subsequent buildings/floors/sections (unless construction works are intensified).

A flow diagram is convenient and easy to use when identical or similar operations of identical or similar volume are to be successively performed in all floors (sections) of a building. In this case, it is easy to identify the causes of delay in a certain construction milestone and the effects of such delay on the commencement of other milestones. However, floors or sections are not always identical or similar (the space of lower floors can be significantly bigger compared to upper floors, i.e. buildings get narrower in upper floors; floors can differ in height; some floors may have a number of partitions, while others can have none, etc.). The above-mentioned reasons may determine unsuitability of a flow diagram for the planning/scheduling of the entire construction. The flow diagram is therefore not a universal method and cannot be used for the planning/scheduling of all and any construction works.

2.3. The use of a network diagram for project planning

The use of a network diagram for project planning involves two basic methods (Neverauskas *et al.* 2007):

- PERT (Program Evaluation and Review Technique). The PERT method is used for a project duration analysis in order to evaluate the probability of completing a project on a given date (Būda, Chmieliauskas 2006).
- CPM (Critical Path Method) is used to identify the critical activities. When the computed earliest start time is less than the latest start time, the difference between them represents the slack time. The critical path is the path in which none of the activities have slack, that is, the earliest and latest start times are equal (Būda, Chmieliauskas 2006).

Graphical representations and computation of mathematical parameters are the same in both CPM and PERT techniques. However, these methods differ in that the PERT method is a statistical one, using a probabilistic approach to task duration and three time estimates: optimistic, most likely and pessimistic, while the critical path method is a deterministic one, using point estimates for task durations and determining the average project duration (Būda, Chmieliauskas 2006).

A simple example of a network diagram is illustrated in Figure 2. Project events are depicted as nodes on the network. Three arrows leading to one node means that all three precedent activities must be completed before starting the next activity. The diagram is drawn in such a way that one activity can give start to 2 (or 3 or more) subsequent activities or vice versa. Fig. 2 shows that 11 activity arrows are connecting 10 event nodes (Lock 2007).

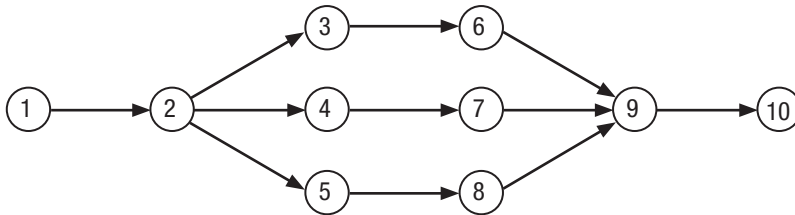


Fig. 2. Network diagram (model) (Source: Lock 2007)

In a network diagram, the full path is a part of the diagram from the start-event (construction start) to the end-event (construction completion). The network diagram may contain numerous of full paths from the start-event to the end-event, all full paths having a certain time slack, as compared to the critical path. Accordingly, activities on the paths can have their time slacks, too. The time slacks indicate that activities may have (and do have) different start and end times. These time slacks and activity start/end times are the parameters of the network diagram.

Taking into account the sequence of technological activities, the longest sequence of activities can be determined. The longest sequence of activities is the critical path. Activities on the critical path are critical activities. The critical path impacts on the overall duration of a construction project. Delay in critical activities for whatsoever reason increases the overall duration of construction (construction completion date is delayed as compared to baseline construction).

Comparison of a network diagram and bar diagram/flow diagram demonstrates the following differences of the latter:

- clear activity linkage and technological sequence of activities;
- possibility to identify activities, completion of which most of all adds up to the longest overall duration of construction;
- possibility to compare several alternative sequences of activities and to choose the best one in order to utilise limited resources in the most optimal way (Абрамов, Манаенкова 1990).

The brief overview of the main construction scheduling methods evidences that a network diagram is the most suitable method for evaluation of effects of a delay in a construction milestone/activity on the subsequent construction milestones/activities. The benefits of the network diagram, as compared to other methods, are indicated above. Currently used other methods have taken over some parameters of the network diagram. Therefore, the aforesaid goal may be also achieved by using bar diagrams or flow diagrams supplemented with the parameters of the network diagram.

3. Liability for violations of the construction completion date

Date of completion is usually set forth in construction contracts and agreements as one of the most important provisions (Krol 1993). Also, it is the provision, which is often violated and the violation results in a dispute between the parties to the contract.

3.1. General principles of contractual liabilities

Liability for the violation of the construction completion date, like for any other contractual violations, should be defined in a construction contract between a client and a contractor of construction works. Unless specifically defined in the agreement, liability defined in the civil law shall apply to these contractual relations. General principles of liabilities are discussed in the Civil Code of the Republic of Lithuania (CC). Article 6.258 of the CC stipulates two types of liabilities, i.e. damages and penalty, which can be specified in further detail. Therefore, the civil law stipulates the following types of contractual liabilities (Fig. 3).

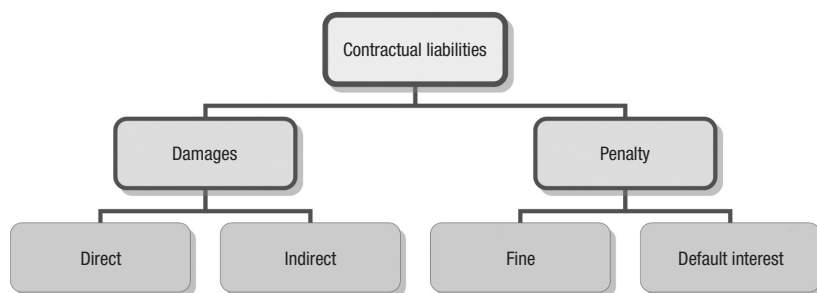


Fig. 3. Types of contractual liabilities

3.1.1. Direct and indirect damages

Damages represent a specific type of contractual liability, as it can be applied in all cases except for rare cases that can be prescribed by the law or stipulated in a contract. Accordingly, compensation for damages is a general type of civil liability imposed for any violations of contractual obligations. In legal terms, damages are understood as negative consequences on the property-related status of an aggrieved party caused by unlawful actions. It is a characteristic of compensation for damages that the non-performing party has to pay money or transfer some assets to the creditor's possession. Compensation for damages is therefore always of a property nature.

In civil law, the principle of compensation of damages in full is prevailing, except for cases when liability is limited by law or contract. Article 6.251 of the CC stipulates that the court, having considered the nature of liability, the financial status of the parties and their interrelation, may reduce the amount of repairable damages if awarding full compensation would lead to unacceptable and grave consequences. However, the reduction may not exceed the amount, for which the debtor has or ought to have covered his civil liability by compulsory insurance.

A liability to compensate for damages appears when a party suffers damages as a result of the violation of legal relations, i.e. suffers negative consequences on its property status.

The damages may consist of two parts:

- direct damages (the expenses incurred);
- indirect damages (the incomes, of which a person has been deprived of).

Direct damages are reduction or loss of actual property. Such damages include expenses incurred by an aggrieved person in order to restore his/her infringed rights or damaged/lost property.

Indirect damages consist of the incomes, of which a person has been deprived of, i.e. the income that would have been received if unlawful actions had not been committed. Lost profits is the anticipated amount of money, which the concerned person

has been deprived of as a result of interrupting the activities, from which the income was to be generated. Lost profits shall be attributed to damages by the presence of such characteristics as reasonable probability of income to be gained if the violation had not been committed. In this context, income is understood as an amount of money that the party would have received in reality from lawful activities.

The amount of direct and indirect damages must be proved by the person who sustained the damages. However, where the amount of damages cannot be proved by the party with precision, it shall be assessed by a court (Article 6.249 § 1 of the CC).

When assessing damages, prices are taken as a basis. For example, as a result of inflation, the amount of damages may greatly differ due to difference in prices valid on the date of contract signing and the date when the obligation falls due. To this effect, the rules of the assessment of damages are laid down in Article 6.249 § 5 of the CC: damage shall be assessed according to the prices valid on the day when the court judgement was passed unless the law or the nature of the obligation requires the application of prices that were valid on the day the damage arose or on the day when the action was brought (Ambrasienè *et al.* 2006).

3.1.2. Penalty: fine and default interest

Penalty has a double nature. On the one hand, it is one of measures to ensure performance of obligations, i.e. to define, by law or contract, an amount of money payable by the debtor to the creditor for non-performance or defective performance of an obligation. On the other hand, it is a type of liability. Penalty consists of a fine and default interest. A fine is a particular amount of money or a certain percentage of the amount of infringed obligation determined in advance by the law or contract. Default interest is an amount of money fixed by the law or contract for the delay in the performance of an obligation. Default interest shall be set for a certain period of time (for each overdue day, week, month and etc.). The primary objective of inserting the interest clause into contracts is to facilitate proper performance thereof.

Application of penalties and damages together raises, as a property liability, a problem of the relation between damages and penalty, as imposition thereof independently one from another would result in violation of the principles of civil liability. The objective of civil liability is to restore the infringed rights of the aggrieved party without constituting a source of enrichment for the aggrieved party. The relation between damages and penalty is defined in Article 6.258 §2 of the Civil Code: in the instances where penalty is established, the creditor may not concurrently demand from the debtor the performance of the principal obligation and the payment of the sum stipulated in the penal clause (the penalty) except in the cases where the time-limit of performance of the obligation is delayed by the debtor. An agreement providing for any other stipulation shall be null and void. In the event of a claim for compensation of damages being made, the penalty shall be included in the damages (Ambrasienè *et al.* 2006).

3.2. Exemption from contractual liabilities

Inflicted damage does not always involve application of civil liability. It depends on the determination of the grounds for civil liability to appear. However, if the required grounds for civil liability are determined, it is necessary to check the existence of grounds for non-application of civil liability.

Pursuant to Article 6.253 of the CC, civil liability shall not apply and a party shall be completely or partially released from its civil liability on the following grounds:

- a superior force (*force majeure*);
- actions of state;
- actions of a third party;
- actions of the aggrieved party;
- the state of necessity;
- self-defence;
- self-help.

A superior force (force majeure) is unavoidable events that cannot be controlled or escaped by a party, and which were not and could not have been foreseen. A party shall be exempted from liability for non-performance of a contract if it proves that the non-performance was due to the circumstances, which were beyond its control and could not have been reasonably expected at the time of the conclusion of the contract, and the arising of such circumstances or consequences thereof could not be prevented. Unforeseeability (meaning that the circumstance has not been foreseen and could have not been reasonably expected by a person) and unavoidability (meaning that arising of the circumstance was of an objective nature and prevention of such circumstance or its consequences was beyond the person's control) are the main characteristics of *force majeure*. *Force majeure* is understood as an event beyond human control, as a circumstance related to natural and/or social phenomena.

Actions of state are binding and unforeseen actions (acts) of public authorities, which render the performance of an obligation impossible, and which could not be disputed by the parties.

Activities of a third person are injurious actions committed by a person for whom neither party to the contract is liable.

Actions of the aggrieved person are the actions committed through the fault of the aggrieved person himself and resulting in the appearance or increase of his damages. Such actions are of a dual nature: consent of the aggrieved person to suffer the damage (actions of the aggrieved person explicitly expressing his striving to suffer the damage) or assumption of the risk (understood as the assessment of a realistic threat of damage and determination to act in a way chosen at his own discretion, when a possibility for the damage to occur is foreseen but own intentions are not renounced).

The state of necessity is a circumstance when a person is compelled to cause damage in order to avoid imminent occurrence of greater damage to the person who has already sustained damage or to any other person.

Self-defence is considered to be the actions committed by a person with the purpose of defending himself or another person, property, inviolability of dwelling, other rights, and interests of the society or the state against commenced or imminent unlawful dangerous assault, providing that such actions do not exceed the limits of self-defence.

Self-help is an autonomous ground for releasing from civil liability. It differs from self-defence in that self-defence implies defending himself against assault or danger, but the person has no intentions to enforce his right. In case of self-help, a person is compelled to enforce his right under conditions when it is impossible to receive timely assistance from public authorities and when the implementation of that right would be rendered impossible or essentially obstructed unless such actions are taken (Ambrasienė *et al.* 2006).

4. Problems faced when determining liability for a delay in construction

Suppose a construction project is in progress. There appear delays in relation to the baseline construction followed by delays in the interim and the final date of completion. The client blames the contractor for all delays, terminates the contract and files a claim against the contractor for compensation of all damages indicated in the plaintiff's claim plus penalty. The situation seems to be quite simple, but in reality there are some problems likely to be faced during the investigation of a particular case of construction delays (see Fig. 4).

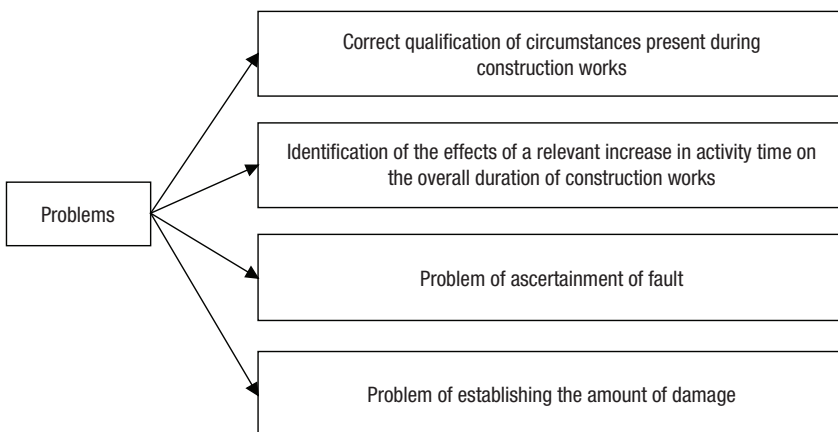


Fig. 4. Problems faced when determining liability for a delay in construction

4.1. Correct qualification of circumstances present during construction works¹

Construction often depends not only on wishes and actions of a contractor and client, but on other actions of nature, state or third persons, as well. It is namely the presence of the latter actions that may determine the exemption from civil liability. In such case, neither the contractor nor the client is liable for delays in construction. However, the same circumstances are often differently qualified by different persons (parties to a contract).

First, it is necessary to find out whether there were any circumstances present during construction that caused delays in construction irrespective of the actions on the part of the contractor or client, and also irrespective of whether they could be qualified as releasing from civil liability or not. For example, a situation may occur during construction that was absent upon contract signing and thus impossible to be reasonably foreseen by the parties. Such situation could result in suspension of construction works, while the parties could neither control nor prevent the situation and the contractor had not assumed the risk of occurrence of the situation, which entailed the need for additional activities not indicated in the contract (construction project). Therefore, this situation could be qualified as force majeure by the above described features.

Yet, different cases involve different situations, and each time it is necessary to identify the features of the situation and its effects on the performance of construction works as well as resultant changes, if any, in the course of scheduled activities, etc. Likewise, it is necessary to establish the duration of the situation causing faults and delays in construction. For this purpose official correspondence among the contractor, the client and the designer, construction workbooks, minutes of the meetings of persons supervising construction works and other relevant documentation are carefully analysed.

Once all the circumstances are determined, the time of meetings regarding the situation and adoption of new design solutions must be measured along with identification of such information as the recorded end of the situation, repetition thereof, if any, and resumption of uninterrupted construction work. All of the above mentioned factors serve for the determination of the length of the situation.

Finally, when the length of the situation causing faults and delays in construction is established (e.g. in days), interim and final completion date is extended by a relevant number of days.

4.2. Identification of the effects of a relevant increase in activity time on the overall duration of construction works

Currently, performance of construction works is mainly based on bar diagrams. Usually the critical path method is used for planning and management of construction projects. The use of diagrams enables construction teams to plan necessary construction resources and properly distribute them so that the project would be completed on time. Diagrams

¹ Qualification means identification of a situation defined in a contract and/or law that corresponds to the actual circumstances occurring in construction.

drawn on the basis of the critical path method are useful not only for project planning/scheduling, but also for project management, i.e. monitoring of activities according to the schedule (Smith *et al.* 2001).

When investigation is conducted, the type of diagrams used for construction scheduling is to be identified first. If construction works were scheduled using a bar diagram (Gantt's chart), such diagram should be converted into a CPM-based network diagram.

Then, the investigation is proceeded using the network diagram to identify critical activities and those that do not lie on the critical path, but the completion of which is scheduled on the last construction date (date of construction delivery to the client), as delay in the latter activities would also add up to the overall duration of construction work. Likewise, activities with a time slack, i.e. activities that can be more or less delayed without delaying the overall duration of construction works, are to be identified. However, whenever delays in the activities, which are not on the critical path, exceed the overall slack time available, this increase in duration impacts on the overall construction time.

The above-described investigation eventually leads to a conclusion as to whether a delay in particular activity added up to the overall duration of construction work.

4.3. Ascertainment of fault

Delays in construction raise a question of fault, i.e. which party is responsible and should pay for it. Whenever a delay is caused by client's actions, contractor's delay is justifiable. Likewise, the client is not entitled to claim damages for a delay caused by its own actions, and the contractor may recover damages suffered as a result of project delays caused by the client (Smith *et al.* 2001).

In case of delays in construction, it is often difficult to establish the party at fault. Even if it seems that construction delays are the contractor's fault, the delays may be actually caused by client's delay to deliver a relevant project component or drawings to the contractor for commencement of construction works.

Therefore, the first thing to find out is whether the client delivers the construction permit and other documents required for the commencement of construction works on time in each particular case. Whenever the client delays the delivery of the documents indicated in the contract, the contractor is entitled to postpone the start time until the date of delivery of the relevant documents and other design (project) documentation. In this case, the interim date and the final construction completion date would be proportionately postponed, and the fault for the delay would lie with the client rather than with the contractor.

Likewise, it is necessary to establish whether or not the contractor delays construction works without a good reason. If the contractor delays the construction project without a justifiable reason, the fault for the delay will lie with the contractor.

Ascertainment of fault is therefore a complicated issue in civil relations. The party, which first breaks the contract and, at the same time, violates the date of construction fixed in the contract (as bar diagrams and other diagrams/charts can be an integral part of the contract) shall be considered as the non-performing party. In each case, it is necessary to identify the existence or non-existence of circumstances impeding on the timely completion of scheduled construction works during the contract that are likely to justify a certain delay of the interim/final construction completion date. In this case, establishment of the party at fault would not be relevant.

4.4. Establishment of the amount of damages

There is no uniform methodology approved for the calculation of damages caused by delays in construction. The client may think he suffered greater damages as compared to the contractor's opinion.

The first thing to establish for the investigation is the amount and grounds of damages claimed. The client may claim payment of direct damages (elimination of construction defects, finishing of uncompleted tasks, costs of materials and other costs suffered as a result of delayed and/or substandard construction works, etc.), indirect damages (profits lost from lease of the premises, depreciation of the building and/or unsold apartments under preliminary contracts of purchase and sale) and penalty (fine and default interest).

Direct damages shall include all costs and expenses claimed by the client to have suffered by the completion of construction. Indirect damages are calculated on the basis of lost profits, i.e. the amount of income to be earned by the client under preliminary contracts of lease and purchase-sale, if the construction was completed on time. In addition, indirect damages include depreciation of the building, i.e. impairment of the value of the building during economic downturn, as compared to its value during economic upturn. Penalty consists of fines and default interest.

Damages can be calculated in different ways on a case-by-case basis. In some cases, damages for delays in construction may be neglected at all if the construction time is not a principal subject matter of the contract. And on the contrary, construction completion time can be the main subject matter of the contract. Yet, specific conditions present during construction works must be each time taken into account. As the case may be, there can be circumstances impeding on the timely performance of construction works, as compared to the baseline construction, and thus providing a justifiable ground for certain postponement of the interim/final completion dates, or there can be other factors determining the release from civil liability or relevant limitation of such liability. It's worth noting that due attention should be paid to calculation of damages under the circumstances, which had the major effects on the delay in construction and whether or not such circumstances could justify the postponement of the construction completion time as compared to the baseline construction.

5. Conclusions

It is not always easy to determine the party at fault for construction delays. The fault may lie with both parties and neither of them, as the case may be. Likewise, there are multiple causes of delays in construction are frequent. This article addressed the problems that arise in determination of liability of construction participants for violations of construction completion date and possible ways of problem solutions.

1. *Correct qualification of circumstances present during construction works.* While investigating the case, each time it is necessary to identify the existence or non-existence of the situation impacting on the performance of construction works and resultant changes, if any, in the course of scheduled activities, as well as the duration of the situation causing faults and delays in construction, etc. Likewise, it is necessary to establish whether the client and the contractor are of the same opinion about the situation. *Solution:* if the above-described situation occurs during construction works, the situation must be objectively reviewed and its real duration must be established. Then interim and final construction completion dates may be extended by adding up the number of days equal to construction delay due to the aforementioned reasons.
2. *Identification of the effects of a relevant increase in activity time on the overall duration of construction works.* While investigating the case, it is necessary to find out and identify whether delay in a relevant activity increases the overall construction duration, i.e. whether or not the activity lies on the critical path and, if it doesn't, whether the delay in activity lasted so long as to impact on the overall construction duration. *Solution:* first, it is necessary to identify the type of diagrams used for construction scheduling. If construction works are scheduled using a bar diagram (Gantt's chart), it is reasonable to convert it into a network diagram in order to measure how one or several delays impact on the duration of subsequent activities and overall duration of construction works. Then, using the parameters of the network diagram, it is quite easy to identify whether or not one or another activity could have added up to the overall duration of construction.
3. *Ascertainment of fault.* It is difficult to identify the non-performing party. For example, the client blames the contractor for delays, while the contractor blames the client for delayed delivery of relevant construction documentation preventing the contractor from timely commencement of construction works. *Solution:* the party, which breaks the contract first (this fact is often difficult to establish as well) and, at the same time, violates the date of completion fixed in the contract shall be considered as the non-performing party. In addition, in each case, it is necessary to identify the existence or non-existence of circumstances impeding on the timely performance of construction works, as compared to baseline construction, and likely to justify a certain delay of the interim/final completion date. In the latter case, establishment of the non-performing party would not be relevant.

4. *Establishment of the amount of damages.* There is no uniform methodology approved for the calculation of damages caused by delays in construction. The client may think it suffered greater damages as compared to the contractor's opinion. *Solution:* specific conditions present during construction works must be each time taken into account. As the case may be, there can be circumstances impeding on the timely performance of construction works as compared to the baseline construction and thus providing a justifiable ground for certain postponement of the interim/final completion dates, or there can be other factors determining the release from the civil liability or relevant limitation of such liability. It's worth noting that due attention should be paid to calculation of damages under the circumstances, which had the major effects on the delay in construction and whether or not such circumstances could justify the postponement of the construction completion time as compared to the baseline construction.

References

- Ambrasienė, D., et al. 2006. *Civilinė teisė. Prievolių teisė* [Civil law. Contract law]: vadovėlis. Trečioji laida. Vilnius: Mykolo Romerio universiteto Leidybos centras. 608 p.
- Arditi, D.; Pattanakitchamroon, T. 2006. Selecting a delay analysis method in resolving construction claims, *International Journal of Project Management* 24: 145–155. doi:10.1016/j.ijproman.2005.08.005
- Assaf, S. A.; Al-Hejji, S. 2006. Causes of delay in large construction projects, *International Journal of Project Management* 24: 349–357. doi:10.1016/j.ijproman.2005.11.010
- Banaitienė, N.; Banaitis, A. 2006. Analysis of criteria for contractors' qualification evaluation, *Technological and Economic Development of Economy* 12(4): 276–282.
- Błaszczak, T.; Nowak, M. 2009. The time-cost trade-off analysis in construction project using computer simulations and interactive procedure, *Technological and Economic Development of Economy* 15(4): 523–539. doi:10.3846/1392-8619.2009.15.523-539
- Būda, V.; Chmieliauskas, A. 2006. *Projektų valdymas* [Project management]. Kaunas: Technologija. 142 p.
- Dilworth, J. B. 1992. *Operations Management*. University of Alabama at Birmingham. Highstown: McGraw-Hill. 723 p.
- Eliyi, D. T.; Korkmaz, A. G.; Çiçek, A. E. 2009. Operation variable job scheduling with eligibility constraints: a randomized constraint-graph-based approach, *Technological and Economic Development of Economy* 15(2): 245–266. doi:10.3846/1392-8619.2009.15.245-266
- Kaleininkaitė, L.; Trumpaitė, I. 2007. Verslo rizikos valdymas ir jo tobulinimas [Business risk management and improvement], *Verslas: teorija ir praktika* [Business: Theory and Practice] 8(3): 176–181.
- Kao, C.-K.; Yang, J.-B. 2009. Comparison of windows-based analysis methods, *International Journal of Project Management* 27: 408–418. doi:10.1016/j.ijproman.2008.05.016
- Keršulienė, V. 2007. Taikaus ginčių, kilusių tarp užsakovo ir rangovo, sureguliuavimo galimybės ikiteisminiu etapu [Possibilities of clients and contractor's disputes settlement at the pretrial stage], *Technological and Economic Development of Economy* 13(2): 139–143.

- Krol, J. J. P. 1993. *Construction contract law*. New York: John Wiley & Sons, Inc. 262 p.
- Lietuvos Respublikos civilinis kodeksas [Civil Code of the Republic of Lithuania]. 2000, *Valstybės žinios* [State News], 2000-09-06, No. 74-2262.
- Lock, D. 2007. *Project Management*. Ninth Edition. Burlington: Gower. 520 p.
- Mitkus, S.; Trinkūnienė, E. 2008. Reasoned decisions in construction contract evaluation, *Technological and Economic Development of Economy* 14(3): 402–416. doi:10.3846/1392-8619.2008.14.402-416
- Mitkus, S.; Trinkūnienė, E. 2007. Hierarchinis statybos rangos sutarties sąlygų modelis [Analysis of criteria system model for construction contract evaluation], *Technological and Economic Development of Economy* 13(3): 244–252.
- Mitkus, S. 2004. Statybos dalyvių rizika ir atsakomybė už statybos produktų defektus [The risk and liability of participants of a construction process for defects of building products], *Ūkio technologinis ir ekonominis vystymas* [Technological and Economical Development of Economy] 10(3): 109–115.
- Neverauskas, B.; Stankevičius, V.; Viliūnas, V.; Černiūtė, I. 2007. *Projektų valdymas* [Project management]. Kaunas: Technologija. 143 p.
- Odeh, A. M.; Battaineh, H. T. 2002. Causes of construction delay: traditional contracts, *International Journal of Project Management* 20: 67–73. doi:10.1016/S0263-7863(00)00037-5
- Radziszewska-Zielina, E. 2010. Analysis of the partnering relations of Polish, Slovak and Ukrainian construction enterprises, *Technological and Economic Development of Economy* 16(3): 432–454. doi:10.3846/tede.2010.27
- Sambasivan, M.; Soon, Y. W. 2007. Causes and effects of delays in Malaysian construction industry, *International Journal of Project Management* 25: 517–526. doi:10.1016/j.ijproman.2006.11.007
- Smith, G. M., et al. 2001. *Common sense construction law*. New Jersey: John Wiley & Sons, Inc. 590 p.
- Sweis, G.; Sweis, R.; Abu-Hammad, A.; Shboul, A. 2008. Delays in construction projects: The case of Jordan, *International Journal of Project Management* 26: 665–674. doi:10.1016/j.ijproman.2007.09.009
- Turskis, Z. 2008. Multi-attribute contractors ranking method by applying ordering of feasible alternatives of solution in terms of preferability technique, *Technological and Economic Development of Economy* 14(2): 224–239. doi:10.3846/1392-8619.2008.14.224-239
- Zaneldin, E. K. 2006. Construction claims in United Arab Emirates: Types, causes and Frequency, *International Journal of Project Management* 24: 453–459. doi:10.1016/j.ijproman.2006.02.006
- Zavadskas, E. K.; Mikšta, P.; Sakalauskas, R.; Šimkus, J. R. 2009. *Statybos organizavimas* [Construction planning]: vadovėlis. 2-oji papildyta ir pataisyta laida. Vilnius: Technika. 272 p.
- Абрамов, Л. И.; Манаенкова, Э. А. 1990. *Организация и планирование строительного производства. Управление строительной организацией* [Construction industry organizing and planning. Construction organization management]: учебник для вузов [High school book]. Москва: Стройиздат. 400 с.

STATYBOS DALYVIŲ ATSAKOMYBĖ UŽ UŽDELSIMĄ

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Santrauka

Paprastai statybos rangos sutartyje kaip viena iš svarbiausių sąlygų būna numatyti statybos darbų vykdymo terminai. Neretai ši sąlyga pažeidžiama ir šis pažeidimas būna ginčo tarp sutarties šalių pradžia. Atlikus mokslinės literatūros analizę, pastebėta, kad dauguma autorių tiria ir nustatinėja statybos termino praleidimo priežastis bei siūlo termino praleidimo analizės metodus, neskirdami arba mažai dėmesio skirdami statybos rangos sutarties šalių atsakomybei už terminų praleidimą. Taip pat šioje srityje išskyla problemų dėl to, kad dėl teisinės sistemos skirtumų sunku pritaikyti savo šaliai skirtingų šalių patirtį. Mokslinėje literatūroje pateikiami atvejai neretai yra idealizuoti, o realiuose statybos projektuose pasitaiko įvairių ypatybių. Šiame straipsnyje nustatoma, kokios problemos išskyla vertinant statybos dalyvių atsakomybę už statybos terminų pažeidimus, ir siūlomi šių problemų sprendimo būdai.

Reikšminiai žodžiai: uždelsimas, Gantt diagrama, CPM, nuostoliai, netesybos.

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