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Research paper

Determination of the extent of damage and calculation of the indemnity in case of natural disaster – tornado in South Moravia

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Abstract: In June 2021, a tornado struck a large area in southern Moravia, causing extensive damage to property owned by individuals and legal entities. A need thus arose to speed up the process of estimating the amount of insurance indemnity. This process involved local inspections and subsequent assessment of quotations from construction companies for repairs, as the adjusters did not have the time and resources to estimate the amount of damage using the usual method, i.e. an itemised budget containing a list of works, supplies and services necessary to restore a structure to its original condition based on an on-site inspection. This article contains a retrospective analysis of the accepted quotations and evaluates differences in terms of scope and price compared to the standard procedure. Four apartment buildings were selected for assessment of the insulation and roof repairs. The results show that there are clear discrepancies between the price as determined by the itemised budget using the usual prices and the construction companies' quotations. The analysis of the selected buildings has indicated that the quotations can by no means be accepted without first establishing the total damage and its actual scope. Major damage caused by a natural disaster will still have to be estimated on the basis of a personal inspection of the damaged property and preparation of an itemised budget created in line with the applicable pricing system.

Keywords: natural disaster, tornado, damage to property, price quotation, itemised budget, wear and tear

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1. Introduction

The increasing frequency of natural disasters raises the need to speed up the damage (or loss) estimation process. Floods, windstorms and earthquakes can result in a very high number of damaged or even completely destroyed structures (such as buildings and roads). For insured property, recovery is financed by insurance indemnity that can be paid out when a claim is processed by the insurance company. Accordingly, the damage estimation process, an integral part of claim settlement, should be as quick as possible in order to facilitate the quick restoration of the affected area.

Taking into consideration the limitations mainly in terms of the number of available claim adjusters, the damage estimation process may be simplified if the situation warrants it. This paper deals with the situation that arose in the South Moravian Region of the Czech Republic after being hit by a tornado, a rare phenomenon in this geographical area that caused substantial damage both to infrastructure (railways) and to private property (family homes and apartment buildings).

This paper is organised as follows. Firstly, the 2021 South Moravia tornado event ("SMT") is described, followed by a presentation of relevant matters related to property insurance and the manner in which the amount of insurance indemnity is determined. The second section describes the research methodology, while the third presents the results and discusses a case study of four residential buildings. The fourth and final section presents the conclusions.

1.1. The 2001 South Moravian tornado in Břeclav and Hodonín area

A supercell with a tornado passed an area in the South Moravian Region on the boundary of the Břeclav and Hodonín districts on Thursday 24 June 2021 at around 19:20 CET [1]. According to the assessment of the Czech Hydrometeorological Institute, it was a strong tornado accompanied by suction vortices, which reached the strength of F4 on the five-point Fujita scale. The tornado reached wind speeds of 267 to 322 kilometres per hour causing extreme damage [2].

As documented by aerial photography, the damaged area was 26 kilometres long and 500 meters wide (Fig. 1). It started at the eastern outskirts of the town of Břeclav, extending roughly to the village of Ratíškovice. The most affected municipalities were Týnec, Moravská Nová Ves, Mikulčice, Lužice, Hodonín, Hrušky and Břeclav; some damage was caused to practically all buildings and monuments in Valtice, including the castle listed as a UNESCO cultural heritage site [3].

In all the affected municipalities, over 1,200 structures, including public, agricultural and industrial buildings, as well as a large number of trees and vehicles were damaged. Infrastructure and a railway corridor were also severely damaged. Between 185 and 200 buildings were marked for demolition [5, 6] and approximately 300 people were injured. The SMT also caused several fatalities (6 people) [7, 8]. The tornado resulted in the largest number of victims in Europe since 11 June 2001 when a similar disaster hit Brusilov, Ukraine. For comparison, the deadliest tornado recorded in Europe since 1950 occurred in

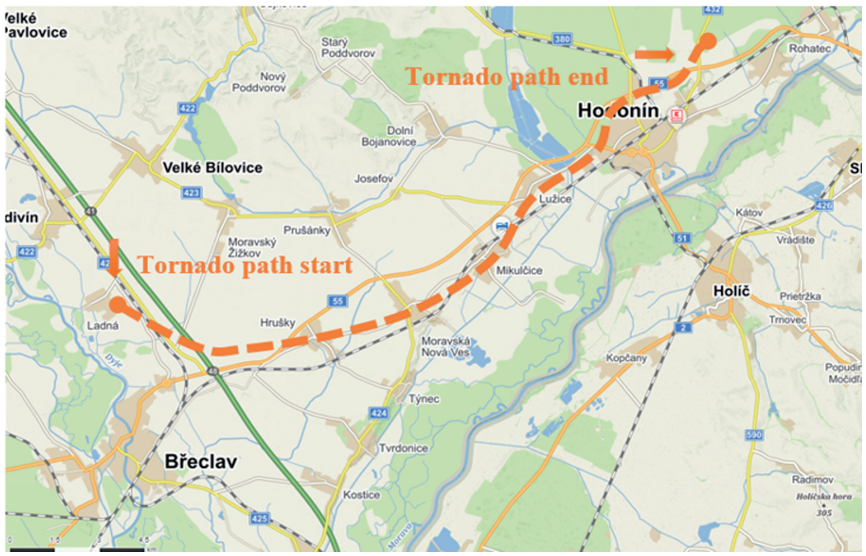

Fig. 1. The approximate path of the tornado, source: annotated base map [4]

Ivanovo, Russia on 9 June 1984, resulting in 69 deaths [9]. Injuries also occurred during clean-up, demolition and construction work. On 1 July, during the demolition of a house in the village of Hrušky, a Panzerfaust-type explosive device was found and bomb disposal experts were called to the site to safely destroy it [10].

Immediately after the tornado hit, a great wave of solidarity arose among the Czech public. Craftsmen and other volunteers began to flock to the affected communities to help with clean-up and construction work or with the distribution of building materials and catering. As of 8 July 2021, approximately CZK 1.1 billion had been raised in donations [11–13]. Emergency accommodation for people from the affected areas and volunteers was also offered by the city of Brno and public universities, and unoccupied city-owned apartments and dormitory beds were also provided for use [14, 15].

1.2. Insurance of immovable property against natural hazards

A tornado is quite an unusual phenomenon in the Czech Republic, with flooding and gale-force winds being far more common natural disasters. The main difference between an ordinary windstorm and a tornado lies in the experts' ability to predict the path of the storm and the potential extent of the damage. The area damaged by a tornado is usually a relatively thin strip hundreds of metres wide and tens of kilometres long, while windstorms or hurricanes hit widespread areas many hundreds of square kilometres in size [16, 17]. In the case of windstorms or hurricanes, weather forecast warnings usually provide people in the threatened area with sufficient time to prepare and secure their assets. By contrast, tornado warnings usually give people at risk very little time to prepare [16]. The damage itself also varies. For example, buildings in New York City are designed to withstand

direct winds of a certain strength. On the other hand, the suction vortices produced by a tornado behave quite differently from usual atmospheric winds and have significantly different effects and modes of action [17]. In particular, a tornado induces more intense aerodynamic loads on the roof and leeward wall [18]. The above shows that the relatively small size of the damaged area is offset by the impossibility of predicting when and where a tornado will occur, resulting in often disproportionate damage to property and life.

Insured individual and companies who have suffered damage can contact their insurance provider [19]. An analysis conducted between 2001 and 2009 showed that the median insurance term ranges from 2–3 years [20]. Insurance is a form of risk management and contributes to the resilience of individuals and businesses affected by a disaster [21]. Incentives for taking out insurance include factors such as lower insurance premiums, lower deductibles, location of the property and previous experience with a natural disaster. Having been hit by a natural disaster before has a major impact on the behaviour of homeowners who have suffered property damage [21], as they learn from the experience. Anticipating natural disasters and other natural catastrophes is a very complex process that ties into the pricing of insurance plans [22]. According to Boudreault, the risk is divided into three components: frequency, intensity and damage [23].

This paper focuses on the damage caused by a tornado in South Moravia, where its occurrence/frequency was not anticipated at all. A majority of the insurance policy holders were legal entities and the insurance covered properties owned by the municipality. By and large, private properties owned by individuals were hardly insured at all. The ratio of individuals and legal entities in the number of insurance settlements was approx. 1 to 10, respectively. An analysis of the available data from the Czech Insurance Association has revealed that the volume of insured damage to property caused by windstorms and hailstorms in 2021 was slightly above CZK 5.5 billion [24].

Assessing the damage to a large area after a tornado strike is a complex and demanding task. This can be simplified, for example, by remote sensing and evaluation using a multi-level mathematical model [25]. This method is suitable when ground access is impaired immediately after the catastrophic event. In the context of insurance, there are two levels of determining the amount of damage: (1) rough estimates for risk modelling, and (2) partial loss assessment at the level of individual insured persons for indemnity calculation [26]. Aggregate loss assessment in a given area is very challenging and requires a lot of data. These data are subject to considerable uncertainty and are often subject to commercial secrets and confidentiality issues [27]. Hence, aggregate assessment and remote sensing are suitable for making rough estimates.

1.3. Determination of the amount of indemnity

This article focuses on the determination of damage and the evaluation of the insurance indemnity paid to insured entities. The specific ways and methods of estimating the damage are determined by the respective insurance company. The generally accepted and used method consists of an inspection on the site, gathering photographic documentation, making a record of the facts and drawing up an itemised budget. Software tools supplied by private

entities can be used for the valuation of construction production and specific works [28]. The most used budgeting programs in the Czech Republic include "Kros 4" developed by ÚRS CZ a.s. and "BUILDpower S" from RTS, a.s. These tools enable the compilation of an itemised budget that is priced according to indicative reference prices [29]. These prices are calculated using the cost method and include labour, material, machinery, other direct costs, overheads and profit. The content of the relevant item or the method of measurement (quantity calculation) is determined according to the price system used [30, 31]. The itemised budget drawn up in this manner includes all the work, supplies and services required for the repair of damaged property. Some insurance companies discount from the insurance indemnity the wear and tear on the building's individual structures, which is expressed as a percentage of the value of a new building [32] in relation to the age of the building. The determination of the wear and tear on individual building structures takes into account the durability of the material, which forms a significant part of the cost of the work [33]. Lastly but importantly, the amount of the insurance indemnity must cover the construction works, supplies and services to restore the property to its original condition. This means that any improvement of, e.g., the thermal insulation properties or making repairs beyond the damage caused by a natural disaster cannot be covered.

The above-mentioned literature shows that in order to determine the amount of the insurance indemnity, the responsible officers must have sufficient economic as well as technical and construction knowledge. This paper examines the methods that were used and accepted by insurance companies in relation to the SMT.

2. Methodology

As mentioned in Chapter 1.3, the actual assessment of the scope of repairs is the responsibility of the insurance company's officer or an independent company contracted by the insurance company. For the preparation of this paper, data obtained through personal participation in on-site inquiries related to damage settlement were analysed. It should be mentioned that the disaster attracted massive media attention, construction works were significantly hampered by the shortage of construction materials and a huge excess in demand for skilled craftsmen. These facts were subsequently reflected in the contractors' price quotations.

Damage estimation was primarily based on the provisions of the respective insurance policies. This means that some types of damage were assessed in the form of an itemised budget according to the applicable price system, while others were discounted by the corresponding level of wear and tear. As a result of the exceptionally high number of claims, some simplification of the entire adjustment process had to be undertaken in order to facilitate the restoration of property as soon as possible.

Construction companies provided price quotations and the adjusters assessed them to ensure that the prices were in line with the usual prices. In the event of a discrepancy, a complaint was lodged with the construction company, which was subsequently discussed with the insurance company. In this way, the payment of the insurance indemnity was considerably accelerated and repairs to the properties were carried out more quickly. This

work aims to retrospectively analyse selected quotations from construction companies and identify the most significant discrepancies between budgeted quotations and reference prices. The methodology can be divided into the following steps:

– First, the specific quotations sent by construction companies with market or cost prices according to their in-house calculation were analysed.
– Subsequently, control budgets were prepared based on the contractors' offering prices, which were priced using reference prices according to the URS 2021/II price system [28, 31]. This was done to check the adequacy of the unit prices offered for the works.
– In the third step, the necessary technical procedures and the scope of repairs were assessed in detail. This was done primarily to check whether the contractor's quotation corresponded to merely restoring the building to its original condition or to its improvement. For example, in the case of a roof which originally lacked heat insulation and waterproofing, but these items were included in the price quotation, the relevant price items were excluded. For the façade, an example could be given with the repair of damage to the external thermal insulation composite system. The construction company proposed to remove the entire system and replace the composite layer, even though repairs could have been done locally.
– Finally, the fourth step comprised an examination of what the value of the quotation should have been, taking into account the wear and tear of the building materials in the event the insurance policy had been negotiated on a "temporal price" basis. This means that the offering budget was reduced by the wear and tear of the materials, which form a substantial part of the price of the construction items. The service lives of the construction parts are determined according to the relevant implementing decree [32] or according to the specific insurance company. For example, a roofing material that has a service life of 80 years and has been damaged after 40 years of use should be discounted by the relevant wear and tear in relation to the expected service life, in this case by 50%. The following equations were used for the individual calculations:
  • Calculation of costs without wear and tear per unit of calculation

$$\text{Total Costs Without Wear and Tear} = \text{Material} + \text{Wages} + \text{Machinery} + \text{Other Direct Costs} + \text{Production Overhead} + \text{Administrative Overhead} \tag{2.1}$$

  • Calculation of costs including wear and tear per unit of calculation

$$\text{Total Costs Including Wear and Tear} = (\text{Material} \times \text{residual value}) + \text{Wages} + \text{Machinery} + \text{Other Direct Costs} + \text{Production Overhead} + \text{Administrative Overhead} \tag{2.2}$$

  • Determination of the amount of wear and tear

$$\text{Property wear and tear} = \text{age of structure} / \text{service life of structure} \tag{2.3}$$

The repair of a damaged building was priced by the construction company according to its in-house costing calculation. The insurance company investigated the insured event,

an approximate budget was drawn up and compared with the construction company's quotation. If the offered budget was approved, an advance payment was made and repairs to the damaged structures could begin immediately. Where discrepancies were found, the offered budget was rejected and returned for rework.

This paper examines the construction companies' offering prices and how they compare with the usual prices, and further identifies and analyses the discrepancies found.

3. Results and discussion

3.1. Input database

The input database contained more than 50 buildings damaged by the natural disaster in the Hodonín area. Some buildings were damaged only to a small extent and the assistance of local craftsmen was sufficient to repair them, while other buildings suffered more extensive damage, most often to roofing and façade. For this study, four representative apartment buildings damaged by the tornado were selected. For two of the buildings (A and B), the extent of damage to the external thermal insulation composite system (the façade) was assessed. For two additional apartment buildings (C and D), damage to the roof, including sheeting and roofing, was assessed. A view of the buildings is presented in Figures 2–5.

Fig. 2. Building A, source: author

Fig. 3. Building B, source: author

Fig. 4. Building C, source: author

Fig. 5. Building D, source: author

An on-site inspection was carried out with respect to these buildings, which revealed the actual extent of the damage to the relevant structures. Subsequently, the price quotations of the construction companies were assessed according to the procedure described in Section 2.

3.2. Analysis of the individual buildings

3.2.1. Building A – Apartment building – fasade repair

On Building A, we addressed the extent of damage to the external thermal insulation composite system. The on-site investigation and the attached photographic documentation revealed only minor damage (Figure 4). To repair the damage, the construction company proposed to recoat the façade with a fibreglass reinforcement mesh and sealant covering the area of approx. 100 m^2. Subsequently, it proposed to apply a silicone plaster to the façade.

During the on-site investigation, it was found that the scope of repairs actually needed in square metres did not correspond to the scope according to the price quotation sent by the construction company (Table 1). In fact, only localised patching of areas of up to 1 m^2 was needed. There was no need to recoat the whole façade to carry out the repair.

Table 1. Comparison of selected items – Building A (UoM – unit of measure), source: author

Damage assessment method	Item	UoM	Quantity	Unit price [CZK]	Total price [CZK]
A.1	Façade surface treatment	m^2	100.80	1,125.00	113,400.0
A.2	Façade surface treatment	m^2	100.80	887.26	89,435.8
A.3	Repair of the façade surface treatment	Set	1.00	3,793.90	3,793.9
A.4	Repair of the façade surface treatment	Set	1.00	3,574.30	3,574.3

Table 2. Comparison of offers and budgets – Building A, source: author

Damage assessment method	Price excl. VAT [CZK]	Price system
A.1 price offer of the construction company	291,173.00	in-house calculation
A.2 budget in the scope according to the price offer	173,973.53	CS ÚRS 2021/02
A.3 budget in the scope according to restoration into the original condition	16,588.52	CS ÚRS 2021/02
A.4 price according to A.3 taking into account wear and tear	16,246.32	CS ÚRS 2021/02

The company's offer was thus about 70% more expensive than the applicable price system would suggest. However, it is important to mention the shortages of workers and ma-

terials in the given area at the time, which might have had an impact on the unit prices of construction works.

Adjusting the budget for the extent of the necessary repairs established according to the findings of the on-site investigation, it was found that adequate repair costs corresponded to only 5% of the total amount according to the construction company's price quotation (Table 2). In this case, therefore, the acceptance of the price offered by the relevant construction company cannot be recommended.

3.2.2. Building B – Apartment building – fasade repair

Figure 5 shows building B according to photo documentation and on-site investigation; a much larger extent of damage than on the previous building can be seen. Foreign objects such as pieces of wood and construction waste were lodged in the façade.

The construction company proposed to remove the external thermal insulation composite system from the front side and then reapply it, including the surface treatment, while maintaining the existing parameters. It proposed to recoat the other sides of the façade with a second layer of fibreglass reinforcement fabric including sealant and final surface treatment.

According to the on-site investigation, the indicated extent corresponded to the actual damage on the apartment building (Table 3). Looking at Table 4 we can see comparable repair costs. The construction company's price offer was adequate and in line with the price

Table 3. Comparison of items – Building B, source: author

Damage assessment method	Item	UoM	Quantity	Unit price [CZK]	Total price [CZK]
B.1	Thermal insulation EPS 70 F, 140 mm thick	m^2	317.05	996.00	315,781.80
	Façade plastering – silicone plaster, 2 mm thick	m^2	646.77	350.00	226,369.50
B.2	Thermal insulation EPS 70 F, 140 mm thick	m^2	317.05	1,099.40	348,564.77
	Façade plastering – silicone plaster, 2 mm thick	m^2	646.77	463.40	299,713.22
B.3	Thermal insulation EPS 70 F, 140 mm thick	m^2	317.05	1,099.40	348,564.77
	Façade plastering – silicone plaster, 2 mm thick	m^2	646.77	463.40	299,713.22
B.4	Thermal insulation EPS 70 F, 140 mm thick	m^2	317.05	1,000.09	317,078.53
	Façade plastering – silicone plaster, 2 mm thick	m^2	646.77	401.17	259,464.72

Table 4. Comparison of offers and budgets – Building B, source: author

Damage assessment method	Price excl. VAT [CZK]	Price system
B.1 price offer of the construction company	1,427,434.86	in-house calculation
B.2 budget in the scope according to the price offer	1,479,945.00	CS ÚRS 2021/02
B.3 budget in the scope according to restoration into the original condition	1,566,683.14	CS ÚRS 2021/02
B.4 price according to B.3 taking into account wear and tear	1,422,332.13	CS ÚRS 2021/02

system, although there was a shortage of skilled workers and materials in the area at the time. The price established by means of the itemised budget was in fact higher than the offered price. This difference was due to the omission of certain elements of the insulation system, such as foundation profiles, corner profiles and plastering strips, which would have subsequently caused the company to go over budget [34, 35].

In this particular case, the price offered corresponded to the budget and could be accepted.

3.2.3. Building C – Apartment building – roof repair

In the case of Building C, we did not assess the façade, but only the damage to the roof structure. The on-site investigation and the attached photographic documentation revealed major damage. The tornado carried away most of the ceramic roofing tiles and part of the lathing. There was also some water damage inside the building.

The construction company priced the removal of the remaining roofing and lathing. It then designed a new roof structure including waterproofing and counter-battens to provide for sufficient air circulation. However, this composition did not correspond to the original structure, which lacked any waterproofing. Roofing system elements were also priced, such as the penetration tiles for the drainage, the penetration for the antenna and the ventilation and roofing tiles.

Table 6 shows the price offer comparison and the correction according to the applicable price system. The construction company significantly underestimated the cost of the entire contract. In fact, it came well below the price according to the actual scope of damage according to the on-site investigation. Another reason for the low price (Table 5) was the supply of construction materials directly from local construction supply companies who tried to provide the materials at the best price, so the construction companies could not make any profit on the construction materials. In this particular case, we did not dispute the claimed price despite the roof structure modifications. It could have been an act of kindness on the part of the construction company towards people harmed by the disaster. The construction company has certainly improved its reputation in the area where it operates.

Table 5. Comparison of items – Building C, source: author

Damage assessment method	Item	UoM	Quantity	Unit price [CZK]	Total price [CZK]
C.1	roof covering assembly	m^2	710.00	180.00	127,800.00
	material – roofing tile – basic, half-tile	m^2	710.00	161.34	114,551.40
	D+M waterproofing membrane	m^2	710.00	32.00	22,720.00
C.2	roof covering assembly	m^2	710.00	348.66	247,548.60
	material – roofing tile – basic, half-tile	m^2	710.00	361.54	256,693.40
	D+M waterproofing membrane	m^2	710.00	87.30	61,983.00
C.3	roof covering assembly	m^2	710.00	348.66	247,548.60
	material – roofing tile – basic, half-tile	m^2	710.00	361.54	256,693.40
	D+M waterproofing membrane	m^2	0.00	87.30	0.00
C.4	roof covering assembly	m^2	710.00	348.66	247,548.60
	material – roofing tile – basic, half-tile	m^2	710.00	658.76	467,719.60
	D+M waterproofing membrane	m^2	0.00	73.97	0.00

Table 6. Comparison of offers and budgets – Building C, source: author

Damage assessment method	Price excl. VAT [CZK]	Price system
C.1 price offer of the construction company	791,743.18	in-house calculation
C.2 budget in the scope according to the price offer	1,375,611.60	CS ÚRS 2021/02
C.3 budget in the scope according to restoration into the original condition	993,670.23	CS ÚRS 2021/02
C.4 price according to C.3 taking into account wear and tear	687,471.72	CS ÚRS 2021/02

3.2.4. Building D – Apartment building – roof repair

We assessed damage to the roof on building D as well. In this case, the damage to the roof cladding was minimal, mainly the ridge and corner tiles were blown off. The roof covering and roof structure itself was almost undamaged.

In this case, the construction company proposed a complete removal of the roof covering, including the lathing. It proposed a new roofing composition including waterproofing and counter-battens that improved on the original composition.

The price offer (Tables 7 and 8) was underestimated relative to the applicable price system, which was mainly due to the supply of building materials directly from construction

supply contractors, but the scope of work was significantly overestimated. Compared to the previous case, this scope of work would certainly not have fit into the budget price. In this particular case, approval of the price offer could not be recommended. Subsequently, the price offer provided by the construction company was also rejected by the insurance company.

Table 7. Comparison of items – Building D, source: author

Damage assessment method	Item	UoM	Quantity	Unit price [CZK]	Total price [CZK]
D.1	roof covering assembly	m^2	1,023.00	190.00	194,370.00
	material – roofing tile – basic, half-tile	m^2	1,023.00	283.78	290,306.94
	D+M waterproofing membrane	m^2	1,023.00	47.00	48,081.00
D.2	roof covering assembly	m^2	1,023.00	348.66	356,679.18
	material – roofing tile – basic, half-tile	m^2	1,023.00	361.54	369,855.42
	D+M waterproofing membrane	m^2	1,023.00	87.30	89,307.90
D.3	roof covering assembly	m^2	102.30	348.66	35,667.92
	material – roofing tile – basic, half-tile	m^2	102.30	361.54	36,985.54
	D+M waterproofing membrane	m^2	0.00	87.30	0.00
D.4	roof covering assembly	m^2	102.30	348.66	35,667.92
	material – roofing tile – basic, half-tile	m^2	102.30	658.76	67,391.15
	D+M waterproofing membrane	m^2	0.00	71.3	0.00

Table 8. Comparison of offers and budgets – Building D, source: author

Damage assessment method	Price excl. VAT [CZK]	Price system
D.1 price offer of the construction company	1,837,487.00	in-house calculation
D.2 budget in the scope according to the price offer	2,316,234.37	CS ÚRS 2021/02
D.3 budget in the scope according to restoration into the original condition	442,643.65	CS ÚRS 2021/02
D.4 price according to D.3 taking into account wear and tear	290,965.33	CS ÚRS 2021/02

Where modern methods and tools are not used for pricing construction work and checking the extent of damage [36–40], there is no other recourse for insurance companies but to conduct detailed on-site inspections and carefully scrutinise repair budgets.

4. Conclusions

This paper analysed four apartment buildings affected by a natural disaster (tornado) that occurred in South Moravia, the Czech Republic, in the summer of 2021. Specifically, we examined the methods of estimating the amount of damage by construction companies and compared them with the reality in terms of the extent of damage to structures and the adequacy of the prices offered in relation to the usual (i.e. reference) prices.

Two cases involved damage to the roof structure, while the other two cases concerned damage to the external thermal insulation composite system.

A valuation was made according to the usual methodology, i.e. an itemised budget containing a list of works, supplies and services necessary to restore the structure to its original condition. The price quotations were compared with the budgets drawn up in accordance with the applicable pricing system, also taking into account the wear and tear and service life of the materials.

The results of the analysis show significant discrepancies between the budgeted prices and the prices offered by construction companies. Although there was a significant shortage of construction materials and labour at the time, the unit prices were broadly similar to those under the price system. For some items, the proposed unit prices were even cheaper. Thus, the significant difference that affected the final price was not so much the price of labour and materials, as might have been expected at that time, but the extent of the repairs carried out on the structures in question, which in some cases differed significantly according to the on-site inspection. The differences may have been due to a lack of knowledge of the insurance company's requirement to restore the structure to its original condition. A specialist company suggested a better quality and standards-compliant solution which also included waterproofing. This did not have a significant impact on the overall price despite the discrepancy. In contrast, there was a major change in the scope of repairs in the case of apartment building D and this had a major impact on the overall price. This incorrectly determined scope of work resulted in a significantly higher total price than the one established on the basis of an itemised budget according to the on-site inspection. The incorrectly determined scope of work may have resulted from the fact that the construction companies did not anticipate that the scope of work under their price offers would be examined and believed only the unit prices would be checked. Therefore, in some cases, the unit prices were lower than the ones under the applicable pricing system, but the construction companies tried to make a profit by increasing the scope of work, which could not have been verified without inspecting the site in person.

A retrospective analysis of their price quotations concluded that only a half of the cases selected met the insurance company's conditions. In conclusion, price quotations cannot be accepted in any case without confirming the total damage and its actual scope. This damage must be estimated by means of a personal inspection of the site and by drawing up an itemised budget according to the applicable price system.

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