BULETINUL INSTITUTULUI POLITEHNIC DIN IAŞI
Publicat de
Universitatea Tehnică „Gheorghe Asachi” din Iaşi
Volumul 62 (66), Numărul 3, 2016
Secţia
CONSTRUCŢII. ARHITECTURĂ

NORMAL WEAR AND TEAR IN ROMANIAN CONSTRUCTION PROPERTIES

BY

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Received: September 5, 2016
Accepted for publication: September 29, 2016

Abstract. The physical depreciation is the loss in value due to physical deterioration in normal conditions of weather. Currently, there are many methods of estimating the normal wear and tear, but most do not take rigorously into account the influence of the actual temperature values recorded in a particular area. I believe that the introduction of the environmental conditions parameter for the estimation of normal wear and tear of buildings is a first step towards a correct estimation. The environmental conditions in Romania reflects the repeated changes in temperature from day-night, in the same calendar month or in the same season, which affects the durability of the construction in time. This situation must be constantly monitored that one can intervene rapidly in buildings with maintenance works even if physical age would not require this.

Keywords: wear and tear; life cycle theory; effective age; depreciation; appraised value.

1. Introduction

Given the global economic context, the destination of the houses receives each day that goes besides the initial utility of housing and protection another one of guaranteeing bank loans with average values and different

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destinations. Gradually, the dwellings value increased correlated with population growth throughout the entire surface of the earth. Currently, the market value of the buildings can be determined depending on the destination of the building, structure, year of commissioning, normal physical wear. The normal physical wear depends entirely on the type of building materials and outdoor temperature conditions. At present normal physical wear is quantified in Romania according to Norm P135/1995, which includes physical wear coefficients for different design.

2. The Current Situation of Calculating Depreciation Construction as Required by Law

Establishing the accurate wear of a building is almost always an exercise in approximation very necessary in assessing the remaining life of the operation of various types of construction.

Currently, the assessment of the wear of a building is based on Normative P135/1995, which includes physical wear coefficients for different design. Related to this legislation, these wear factors were taken by -GEV 500- Evaluation Guide "Determining the taxable value of buildings" and the new Fiscal Code which came into force on 1 January 2016. Also in the new Guide Rating -GEV 500 the normal classification of fixed assets, differentiated groups and subgroups of objects and environments of use were taken from Decision no. 2139 of 30 November 2004. The classification is diversified by introducing for each subgroup the technical condition (very good, good, satisfactory).

It is estimated that the technical condition of the building with normal depreciation on the following categories:

a) Very good (VG) – the situation in which current repair and the overhaul repairs were made on time and in good condition maintenance,

b) Good (G) –the situation where they performed maintenance and current repairs on time and on acceptable terms, but no overhaul repairs were made.

c) Satisfactory (S) –situation where they performed some maintenance at most, completely disregarding the current and capital repairs.

According to Norm P135/1995, we have 39 annexes in which we can enclose various types of construction and then using a calculation relation wear can express percentage of that construction. The wear coefficients were developed for the entire life of the construction into operation until the date of removal from service.

3. The Methodology for Estimating the Building Decay. Wear, Durability, Reliability

The measurement of fixed assets depreciation is done in different ways depending on its nature, the parameter that expresses the degree or rate of wear.

To properly assess the wear should be taken into account other factors that will be shown below.

In general, the degree and rate of wear (G_{un}), is dependent on the size of the main factors to be considered in cases of obsolescence, as follows:

$$G_{un} = f(D, C_{eî}, M, C_m),$$

where: D is the life of the asset, materialized between the time of its commissioning and when assessing the degree or rate of attrition; $C_{eî}$ – operating conditions and maintenance, resulting in the manner and pace of repairs current capital repairs of capital goods regulated by law, strictly observing that for which it was designed and executed the asset, namely the construction in question.

The first two factors can appreciate as Norm P135 / 1995.

$$K_1 = D + C_{eî}, \text{ coefficient of wear 1,} \tag{1}$$

$$K_2 = M + C_m, \text{ coefficient of wear2,} \tag{2}$$

$$G_{un} = K_1 + K_2, [\%], \tag{3}$$

where: M is the nature of the main material of which is made the asset, the physico-chemical properties, the rate of "aging" of these, etc.; C_m – the environmental conditions that are exploited fixed assets, including climatic agents action here variability, the variation in temperature from summer to winter gelivitate, wind, earthquake, flood, etc.

The scenario for the period 2001-2030 to the current period 1961-1990 developed by ANM indicates that there is constant temperature anomaly trends and variations in temperature elevations.

The projections of changes of the monthly average temperature of the air at the 94 meteorological stations for the period 2001-2030 made by using the statistical downscaling models applied to the three global climate models show the same signs of increased air temperature, with some differences in signal strength. The average of the projections assembly of the three models is the optimum (most likely).

For the period 2001-2030, compared to 1961-1990, it is projected an increase in average monthly air temperatures higher in the months from November to December and during the warm season (May to September), about 1°C, a little higher values (up –1.5°C to 1.4°C) are in the mountains and in the south and west of the country. In the cold season the warming does not exceed 1°C**.** The average annual warming for the whole country is between 0.7°C and 1.1°C, the highest values being in the mountains.

All these studies lead to the conclusion that the real-time temperature parameter can be taken into account in determining normal wear different types of construction.

According to Norm P135/1995 one can appreciate the following relationship where V_{ef} has an intermediate value between the values that we find regulatory analyzed:

$$G_{fn} = G_{un1} + \frac{G_{un2} - G_{un1}}{V_2 - V_1}(V_{ef} - V_1), \tag{5}$$

where: G_{un1} is the degree of impairment to normal physical age V_1; G_{un2} – the physical degree of impairment is normal for age V_2.

According to Table 1 from -GEV 500- Evaluation Guide "Determining the taxable value of buildings" and the new Fiscal Code which came into force on 1 January 2016, we can express the approximate wear the technical condition of the building VG-considered to be very good, G-good, S-satisfactory by age.

Table 1
Cultural and Social Housing Construction

Age (in years)	Residential buildings, hotels, dormitories			Buildings for social housing, motels, dormitories located in industrial centers									On ground and underground public toilets					
	Structure																	
	Masonry (brick, artificial, blocks, stone) concrete or metal			Wood,adobe, stabilized earth			Masonry (brick, artificial, blocks, stone) concrete or metal			Wood, adobe, stabilized earth			Wood			Masonry, concrete or metal		
	Technical situation																	
	FB	B	S	FB	B	S	FB	B	S	FB	B	S	FB	B	S	FB	B	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	5	-	-	-
4	-	-	5	-	3	5	-	5	7	-	3	5	2	5	13	-	-	5
6	-	5	8	5	7	10	5	8	10	5	7	9	11	14	21	-	5	8
8	5	8	11	8	10	13	8	11	13	8	10	12	20	23	29	5	8	11
10	8	11	14	17	20	23	15	18	20	19	21	23	29	32	37	8	11	14
15	13	16	19	26	30	33	22	25	27	30	32	34	51	53	58	15	19	22
20	18	21	24	35	40	43	29	32	34	41	43	46	73	75	79	22	27	30
25	23	26	29	45	50	53	36	39	41	52	54	58	95	97	100	29	35	38
30	28	31	34	55	60	63	43	46	48	63	66	70	-	-	-	37	42	46
35	33	36	39	65	70	73	50	53	55	74	78	82	-	-	-	45	50	54
40	38	41	44	75	80	84	57	60	63	85	90	95	-	-	-	53	58	62
45	43	46	50	85	90	95	64	67	71	-	-	-	-	-	-	61	66	70
50	48	52	56	-	-	-	71	74	79	-	-	-	-	-	-	59	74	78
55	54	58	62	-	-	-	78	82	87	-	-	-	-	-	-	77	82	86
60	60	64	68	-	-	-	85	90	95	-	-	-	-	-	-	85	90	95
65	66	70	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	72	76	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	78	82	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	85	90	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

In all three cases analyzed according GeV 500, the determined attrition has a linear increase virtually without taking into account C_m – the environmental conditions in which they are exploited fixed assets, including here variability action agents climatic variation in temperature from summer winter.

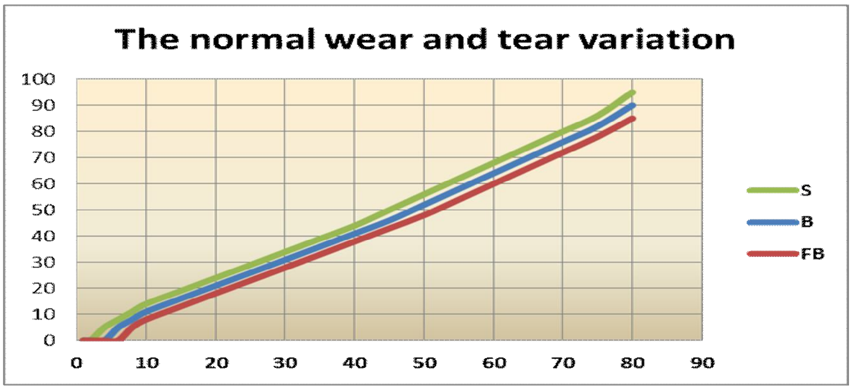

Fig. 1 – The normal wear and tear variation according to Table 1 of -GEV 500.

If you would take considerably and this parameter C_m – the environmental conditions in which they are exploited fixed assets based on the values of minimum and maximum temperatures for each month (per day) recorded in the area where the building is located, the final result would reflect how the closer to reality the actual wear, depending on the actual environmental conditions in the area.

The total depreciation, expressed as a coefficient size by grade or wear G_u involves three distinct components namely:

a) normal wear expressed by normal wear G_{un};

b) accidental wear, wear expressed by accidental wear, G_{ua};

c) obsolescence wear expressed by the degree of obsolescence wear, G_{um};

$$G_u = G_{un} + G_{ua} + G_{um}\,. \tag{6}$$

The practice of designing and building construction revealed the following components – important elements – the system for housing construction and their weights, Table 2.

The global environment wear for housing construction, taking into account the normal wear for each element of the system - building for housing - will be:

$$G_{un} = \sum p_i D_{un}^e\,, \tag{7}$$

where: p_i is the share of the item of the element building system for housing, [%], Table 2; D_{un}^e – the wear of each element of the system, taken either from the normative basis depending on length of service consumed, or established on the basis of technical expertise, developed by a specialist in evaluating construction expertise which finds the spot, methods and specific procedures technical condition of the item, thus its degree of wear.

Table 2
The p_i Share of Structural Elements of a Building Housing System
(according to P135 / 1999)

No.	The item name – part of the system	The share of the item p_i in the system, [%]
1	***The resistance structure*** (foundations, structural frame, framing)	$P_1 = 40$
2	***The tire*** (closures, divisions, seizures, carpentry, covering with its annexes)	$P_2 = 17$
3	***Finishes*** (wet or dry plastering, painting, flooring, painting)	$P_3 = 25$
4	***Functional service facilities*** (heating, electrical, plumbing, low current, gas)	$P_4 = 18$
	TOTAL	100

4. Conclusions

In the context of climate change of an increasingly precise quantification of normal wear and tear of residential buildings takes on a growing importance. It can be appreciated that the determination of the normal coefficient of wear greatly helps determine the value of a property, determining the remaining real life though physical age of the building is much smaller. At the moment, the determination is made using the Normative normal wear P135/1995 or on the observations to those skilled in the field. For greater precision one needs to consider the variations in temperature recorded in the period under review astefel that wear so calculated to reflect the real situation in the respective area.

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* * * Evaluation Guide GEV 500 and Annexes 1-4.

UZURA FIZICĂ NORMALĂ

(Rezumat)

Uzura fizică normală reprezintă pierderea valorii unui contrucţii datorită deteriorării fizice în condiţii climaterice normale. Deşi, există numeroase metode de estimare a uzurii fizice normale, majoritatea nu iau în calcul în mod riguros influenţa reală a valorilor de temperatură înregistrate într-o anumită zonă. În momentul de faţă aprecierea uzurii unei construcţii se face pe baza Normativului P135/1995, care cuprinde coeficienţii de uzură fizică pentru diferite soluţii constructive. Gradul sau coeficientul de uzură este dependent ca mărime de principalii factori ce se constituie în cauze ale uzurii: durata de exploatare a mijlocului fix, condiţiile de exploatare şi întreţinere, natura materialelor principale din care este realizat mijlocul fix. Dacă s-ar lua în considerere condiţiile de mediu în care sunt exploatate mijloacele fixe pe baza valorile temperaturilor minime şi maxime pentru fiecare lună (pe zile) înregistrate în aria unde se află imobilul, rezultatul final ar reflecta la modul cel mai aproape de realitate gradul de uzură real, în funcţie de condiţiile reale de mediu din zona respectivă.