



ATTEMPT OF WAREHOUSES CLASSIFICATION FROM THE POINT OF VIEW OF FUTURE USERS

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ABSTRACT. Background: Businessmen intending to rent or purchase a warehouse facility find it difficult to compare them. Surface area, cubic capacity or the number of reloading docks are not sufficient factors to make a decision.

The aim of this paper is to provide a basis for the creation of international system of evaluation of warehouses from the point of view of future investors.

Methods: A literature review was carried out in terms of magazine division. Then, using comparative analysis, the identified divisions were collated.

Results: The set of parameter and their values for three different warehouse classes are suggested in the final table. The presented parameters of the division are a preliminary proposal of the possible classification system of warehouses.

Conclusions: The assumption of this publication is to start a discussion on the division of warehouse facilities into classes, which will ultimately lead to crystallization of the division, useable for businessmen during the investment process.

Key words: warehouses classes, storage classes, warehouse classification.

INTRODUCTION

Businessmen intending to rent or purchase a warehouse facility find it difficult to compare them. Surface area, cubic capacity or the number of reloading docks are not sufficient factors to make a decision. Some real estate agencies, therefore, use warehouse classes, in fact, class A, to identify potential best locations. However, there is no consistency in defining warehouse classes, which requires ordering. As far as the parameters of the class A warehouse are available on the Internet (although to their consistency one may have doubts), the existence of definitions of the alleged classes B or C is unclear. It is necessary to create an international system of evaluation of logistic properties in order to make it easier to compare and offer them to potential buyers or tenants.

DIVISIONS OF WAREHOUSES

The division of warehouses can be carried out according to various criteria. An example of the diversity of classifications is presented in Table 1.

Apart from the first one, the divisions are in principle not strict with a significant possibility of interpretation of the criteria applied. Functionally, a contract warehouse can be both a distribution and, in some cases, a production one. In the constantly growing trend of direct Internet sales (e-commerce), production warehouses become distribution warehouses [Hrach, Alt, 2018].

It is rare for warehouses to be operated manually, mechanically or automatically - in

practice, in most cases in a single facility, a variety of technological solutions are applied at different scales [Prakash, Prakash, 2018; Bieringer, Müller, 2018].

Table 1. Examples of warehouses divisions

Divided by	Groups of division	Source
Construction	open half-open closed	[Wojciechowski, Wojciechowski, Kosmatka 2009]
Function	distribution production contract	[Van Den Berg, Zijm 1999]
Technology applied	manual mechanized automatized	-
Usable height	low height medium height high-bay	-

Neither is the last division unequivocally interpreted. It should be assumed that low storage warehouses are operated manually (assuming the use of ladders) or with the use of walk-behind forklift trucks. Medium storage warehouses are limited by the lift height of

counterbalance trucks (although modern walk-behind forklifts have slightly lower lift heights). High bay warehouses, on the other hand, are served by reach trucks or other devices, with similar or higher lifting heights [Culler, Long, 2016].

COMMERCIAL PROPERTY CLASSES

The above divisions of warehouses, which are important during their operation, do not offer support in making decisions about the desired facility. This offers a division of buildings transferred from the office space classification into classes A, B, and C, but not defined in the scientific literature. Hence, most of the sources, on the basis of which the division of warehouse space is created, are marketing sources. Therefore, it requires a scientific approach.

Table 2. Example criteria for the classification of office buildings

Building class	Class description
A	"A classification used to describe an office building with rents in the top 30 to 40 percent of the marketplace. Class A buildings are well-located in major employment centres and typically have good transit, vehicular and pedestrian access. Additionally, they are located adjacent to or in proximity to a high number of retail establishments and business-oriented or fast casual restaurants. Building services are characterized by above-average upkeep and management."
B	"A classification used to describe an office building with rents that are based between those of Class A and Class C buildings. Class B buildings are in good to fair locations in major employment centres and have good to fair transit, vehicular and pedestrian access. They are located adjacent to or in proximity to a moderate number of retail establishments and business-oriented or fast casual restaurants. Building services are characterized by average upkeep and management."
C	"A classification used to describe an office building with rents in the bottom 10 to 20 percent of the marketplace. Class C buildings are in less-desirable locations relative to the needs of major tenant sectors in the marketplace. They can be older, neglected buildings in good locations or moderate-level buildings in poor locations, so transit, vehicular and pedestrian access may vary. Typically, fewer amenities and restaurants are found in or near these buildings, and they are usually of moderate to low quality. Building services are characterized by below-average upkeep and management."

Source: Commercial Real Estate Development Association, <https://www.naiop.org/en/Research/Terms-and-Definitions?letter=C> access 12.12.2018

The definitions offered by the developers and real estate agencies are not in any way agreed, and their consistency is a matter of chance - it is not possible to directly compare class A objects of two different associations of real estate agencies. At most, you can expect regional, informal arrangements in limited markets. Not only the lack of consistency, but also the lack of clear criteria raises doubts when allocating to particular groups.

Examples of criteria described on the websites, classifying particular classes of warehouses, are listed in Table 2.

CLASSIFICATIONS OF WAREHOUSE FACILITIES

Classifications of warehouse facilities published on the websites are similarly inconsistent, not only in terms of the value of indicators, but also in terms of evaluation criteria. While class A definitions are relatively

easy to access, other classes are much more difficult to find. This indicates the current, only marketing function of this unclear classification.

One of the most comprehensive and detailed classifications is presented on the Impact Real Estate Agency website. In the classification (without a given source) there are 6 classes (A+, A, B+, B, C, D), and the last class includes, among others, cellars. This is a classic approach of a real estate agency, without taking into account the communication of the plot with the road network. In this aspect

the CBRE classification is more exhaustive, but in principle it focuses on class A facilities. On the other hand, the Realty Module classification will focus on the quality of warehouse facilities. Apart from real estate agencies, one can find the definition of warehouse class among companies dealing with trainings - an example is Trans.eu Group S.A. and the definition of A-class warehouses available on the website.

The list of parameters in each identified classification is presented in Table 3.

Table 3. Example criteria for classifying warehouses (class A)

Classification parameter	CBRE	edu.trans.eu	Knight Frank
Location of the facility			
access	unlimited	-	-
communication with the road network (distance to the main traffic junction)	to 10 km	-	necessary
outside residential areas	required	-	-
Area of the facility			
yard	full-size	-	yes
parking of passenger cars	yes	-	yes
truck parking	yes	-	yes
fenced area	yes	yes	yes
lighted area	yes	-	yes
protected / guarded area	yes	-	yes
monitoring of the warehouse complex	yes	yes (class A++)	yes
Object parameters			
minimum usable height [m]	10	8-10	10
minimum length [m]	75	-	-
minimum load capacity of the floor [t/m ²]	5	5	5
floor dust cover	-	-	yes
columns / pillars grid [m]	12x24 12x22,5	12x24	9x24
share of office space	5-10%	-	(required)
Facility equipment			
minimum number of loading and unloading dock per m ²	1/1000	1/1000	1/1500
minimum number of 0 level gates per m ²	1/5000	1/5000	-
smoke detectors	-	yes	yes
sprinklers system	preferred	-	yes
Installations			
minimum illumination intensity [lux]	150	-	-
energy efficiency	preferred	-	-
LED lighting	preferred	-	-
skylights	-	yes	-
heating system	-	yes	yes
ventilation system	-	yes	yes
optical fibres	-	yes	yes
autonomy-voltage and thermal unit	-	-	yes
Others			
minimum lease term	3 years	-	-
illuminated landscaped area	yes	-	yes
professional management system	-	-	yes
experienced developer	-	-	yes
the system of accounting and control employee access	-	-	yes
CCTV	-	-	yes
proper proportions of length and width of the warehouse	-	-	yes
modern building	-	-	yes

Source: <http://bachfest-leipzig.com/classification-warehouse/#more-51> access 15.12.2018, www.industrialgo.pl/czy-wiesz-ze/1 access 15.12.2018, <https://edu.trans.eu/kursy/magazyn/magazyny-w-pigulce/3> access 15.12.2018

Part of the parameters, if present in at least two classifications, is in agreement. Differences exist in the definition of:

- the distance to the nearest communication node, which is crucial from the point of view of the future user,
- the usable height of warehouses and the preferred column grid,
- the number of reloading docks per square metre of the warehouse,
- level 0 gates availability.

Some of the parameters of warehouse equipment, indicated in the available data, are necessary, for example, for reasons of occupational health and safety – for example the indicated value of lighting intensity (150 lux) is sufficient in the temporary work zone. In areas where workers are permanently present, such as control areas, a value twice as high is required.

Some of the criteria used, for example, "modern building" or "experienced developer", are not measurable and their application would require the establishment of valuable indicators, e.g. a building that has been in use for no longer than 10 years. What does not include modernized facilities, and even considering a modernized facility as modern, there is a question of scale/scope of modernization.

Also, criteria that are not strict, such as parking lots for cars and trucks, the manoeuvring area in general, or the availability of office space without specifying the space, are not sufficient for a detailed assessment of potential warehouse facilities.

Among the indicators not identified in the available data, attention should be paid to the size of the social facilities (expressed in terms of the number of employees who can use it during one shift).

The parameters of the remaining classes (assuming two classes, B and C) of warehouses

are not available in such a wide interpretation. In general, it can be assumed that:

- the usable height of warehouse halls drops, even down to 6 meters in the case of class C facilities,
- the column grid is 'thickened',
- the number of modern installations, including heating and teletechnical installations, is decreasing,
- it is more difficult to access the warehouse, manoeuvring on the yard is complicated,
- number and quality of docks is decreasing,
- the quality of the warehouse itself, as well as social and office facilities also decreases, although this is a subjective parameter.

Many of the required parameters of the warehouse facilities are values resulting not from the infrastructure, but from the planned flows. These include, among others, the number of docks or the number of parking spaces. Also, the size of social and office facilities is not a universal parameter but results from the user's needs - the volume of planned flows, the level of employment, etc. Therefore, these parameters should not be treated as universal, but resulting from real demand. Of course, theoretically "the more, the better", but practically many users do not use the whole potential of class A warehouses. It is enough to look at the long strings of closed gates of logistic centre loading bays, already at first glance used in fractions of percent.

However, some parameters can be correlated. For example, if the expected minimum number of loading bays for class A is 1/1000 m², it can be assumed that one parking place for trucks is required per loading bays.

Many commercial areas for storage of goods are referred to as class A warehouses. However, it is difficult to find rental offers for B and C class warehouses. An attempt to define basic parameters of both A-class warehouses, as well as B and C-class warehouses, by analogy to the available A-class definitions, can be found in table 4.

Table 4. Attempt to define basic parameters of warehouse classes

Classification parameter	Class of the warehouse		
	A	B	C
Location of the facility			
access	unlimited	unlimited	limited
communication with the road network (distance to the main traffic junction) [km]	up to 10	up to 50	above 50
outside residential areas	yes	yes	option
Area of the facility			
truck manoeuvring on the yard	unlimited	unlimited	limited
number of truck parking slots per sqm	1/2000	1/10000	any
number of car parking slots	as required	below requirements	any
fenced area	yes	yes	option
lighted area	yes	option	option
protected / guarded area	yes	yes	yes
monitoring of the warehouse complex	yes	option	option
Object parameters			
minimum usable height [m]	10	8	6
length/width ratio	2/1	any	any
minimum load capacity of the floor [t/m ²]	5	below 5	below 5
floor dust cover	yes	yes	option
columns / pillars grid [m]	12x24/22,5	9x24/22,5	any
share of office space	5-10%	any	any
Facility equipment			
minimum number of loading and unloading dock per sqm	1/1000	1/5000	any
minimum number of 0 level gates per sqm	1/5000	1/10000	any
smoke detectors	yes	yes	option
sprinklers system	yes	option	option
Installations			
energy efficiency	preferred	option	option
skylights	preferred	option	option
heating system	yes	option	option
ventilation system	yes	yes	yes
optical fibres	yes	option	option
autonomy-voltage and thermal unit	option	option	option
Others			
minimum lease term	3 years	2 years	1 year
illuminated landscaped area	option	option	option
the system of accounting and control employee access	option	option	option
CCTV	option	option	option
Modern building	option	option	option

Source: own work based on sources from table 3

parameters excludes investments, others qualify it only for less attractive ones.

CONCLUSIVE REMARKS

The presented parameters of the division are a preliminary proposal. The assumption of this publication is to start a discussion on the division of warehouse facilities into classes, which will ultimately lead to crystallization of the division, useable for businessmen during the investment process.

The interpretation of parameters from the point of view of science should be combined with the point of view of practitioners. Therefore, it is important to look at the division in terms of the significance of individual parameters - the lack of some

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Celem pracy jest stworzenie podstaw dla zbudowania międzynarodowego systemu oceny przydatności powierzchni magazynowych z punktu widzenia przyszłych inwestorów.

Metody: Przeprowadzony został przegląd literatury pod kątem podziału magazynów. Następnie, wykorzystując analizę porównawczą, zestawione zostały zidentyfikowane podziały.

Wyniki: W tabeli końcowej zaproponowano zestaw parametrów i ich wartości dla trzech różnych klas magazynowych. Przedstawione parametry podziału są propozycją wstępną.

Wnioski: Założeniem niniejszej publikacji jest zainicjowanie dyskusji na temat podziału obiektów magazynowych na klasy, co ostatecznie doprowadzi do krystalizacji podziału, użytecznego dla przedsiębiorców w procesie inwestycyjnym.

Słowa kluczowe: klasy magazynów, magazynowanie, podział magazynów, magazyn

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