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**MODERN OFFICE BUILDINGS ACCORDING TO SHELL
AND CORE STANDARD – DESIGN EXPERIENCE
1995–2013****NOWOCZESNE BUDYNKI BIUROWE W STANDARDZIE
SHELL AND CORE – DOŚWIADCZENIA PROJEKTOWE
Z LAT 1995–2013****Abstract**

Kraków has become the second largest concentration of office businesses in Poland. The modern office building industry is rapidly developing here; by the end of 2012 the total office stock exceeded 600 000 m². It is estimated that about 50 000 m² of new offices are being constructed here each year, mostly by developers who specialize in the office market. As the needs of future tenants are unknown at the design and construction stage, office buildings are erected as unfinished and empty boxes. This allows developers to avoid bearing unnecessary risk and labour, and to ensure that the construction is completed, including structure, enclosure and vertical core, prior to the tenant's finishing touches (furnishing and fittings). The basic challenge for architects in this field is the necessity to harmonize the conflicting needs of investment effectiveness with design flexibility.

Keywords: outsourcing, modern office buildings, shell and core standard

Streszczenie

Kraków stał się drugim po Warszawie największym w Polsce obszarem koncentracji firm prowadzących działalność w branży outsourcingowych usług biurowych. Rozwój budownictwa biurowego jest tu prawdziwym fenomenem: pod koniec 2012 roku krakowskie zasoby powierzchni biurowej przekroczyły wartość 600 000 m², szacuje się, że co rok przybywa tu nowych budynków biurowych o powierzchni około 50 000 m². Obiekty te wznoszone są przez wyspecjalizowanych deweloperów. Aby dostosować je do zróżnicowanych i nieznanych na etapie projektowania potrzeb przyszłych najemców, redukując przy tym nakłady inwestycyjne, czas i ryzyko straconych robót, obiekty te wznosi się jako niewykończone, puste w środku. Zasadniczym wyzwaniem, przed którym stoi projektant budynków biurowych na wynajem, jest pogodzenie wymagań dotyczących efektywności inwestycji z uniwersalnością i elastycznością projektu, która umożliwi realizację zróżnicowanych potrzeb ich przyszłych najemców.

Słowa kluczowe: outsourcing, budynki biurowe, standard shell and core

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1. Introduction

Most building development projects now constructed in Poland are of a speculative nature. They are designed and built without the final user's involvement. This is how almost all residential buildings, shopping centres and modern office buildings to let, which are probably the most typical examples of this phenomenon, are built. To adjust them to the diverse needs of future tenants, which may still be unknown in the design phase, and to reduce investment outlays, time and the risk of unnecessary work, the buildings are offered unfinished and empty inside. The development industry, with its characteristic straightforwardness, coined the term *Shell and Core* for this standard. It is difficult to find the Polish equivalent for this concept. Perhaps it should be termed as a "partly finished roofed building shell" or a "finished building with space to let in the form of a shell", so the original term *Shell and Core* is simply used in the Polish investment market and by the construction industry. Similarly, to international corporations, the development industry often uses definitions, terms and standards in their original language, which by the way, can sometimes lead to mistakes and confusion¹.

In *Shell and Core* office buildings, only façades and the central core in which there are service risers, lift shafts, and common space, i.e., corridors and stairways, are finished. Building surroundings, access roads and underground garages are finished, whilst office space which accounts for the largest part of the usable area is finished and furnished only after the contract with the tenant is signed on the basis of separate design documentation (interior design phase). The phase of finishing the office space, known as *Fit-Out*, is completed either when the construction is about to be ready or when the building has been already given up to use. With the profitability of investment in mind, a very important feature of design is minimizing common space, installations and construction elements to the benefit of the space to let. In a well-designed office building the ratio of the total office area to the net usable area (to be let) on a given floor, i.e., the effectiveness indicator of the office floor, must exceed 80% and sometimes even reaches 90%. Another commonly used effectiveness indicator is the so-called *Building BOMA Ratio*, which represents the ratio of the total area to let to the total usable area of the building. This indicator should be higher than 0.80. For this very reason unfinished office buildings, in which the area to let forms a vast majority of the building's projection, look like empty shells with façades.

2. The phenomenon of office building development in Kraków

The capital of the Małopolska region has become Poland's second largest concentration of modern office facilities after Warsaw. Most firms located in these office buildings are in

¹ Polish PN-ISO construction standards for calculating area differ in some detail from those used by western developers, e.g. US BOMA (*Building Owners and Managers Association*), RICKS (Britain's Royal Institute of Chartered Surveyors) or the German GIF.

business support services, chiefly in the BPO², SCC³ and IT sectors⁴. At the end of 2012, Kraków's office space exceeded 600 000 m²; it is estimated that around 50 000 m² of new office buildings are added every year to the area. This trend, typical of post-industrial cities, will continue in the near future [CBRE 2013].

The assets of Kraków as one of Poland's largest business, administration and academic centres include the availability of human capital such as graduates of local universities (to which 200,000 students attend), convenient national and internal transport connections, high living standards, modern office infrastructure and – paradoxically – the concentration of outsourcing companies which offer increasingly more experienced local human resources. The city has already attracted major investors: AON Hewitt, Capgemini, Capita, Cisco, Delphi, Google, Heineken, IBM, Lufthansa, Motorola, Shell, State Street. The business service industry is the youngest and most rapidly developing business sector in the city; 80 specialist firms employ as many as 26 000 people. The average age of employees in this service sector is 28 [Żurawik 2013]. Due to system transformation, which has resulted in the replacement of industrial activities by specialized IT services, Kraków has joined the new generation of cities; hubs of the world's economic information which are characterized by the high dynamics of spatial systems. At the same time it should be noted that Kraków is a conservative city zealously protecting its heritage, which sometimes leads to disputes and conflicts, when it comes to the planning of new investment. The development of office construction is rather spontaneous in Kraków; office buildings are scattered and no *Central Business District* has been created as is the case of many other metropolises.

The first modern A-class office buildings began to spring up in Krakow in the late 1990s, chiefly in Poland's reviving banking sector. At that time the largest office tenant in the city was the Przemysłowo-Handlowy Bank, which rented two modernized large office buildings: the tall building in Bohaterów Getta Square and the former office building of RSW "Prasa" at Grzegórzeckie Roundabout (now: the Cracovia Business Centre, commonly known as *blekitek* [the Blue House]). Another major office development project, in this case in the form of offices to let, was the Lubicz Office Centre, with an area of around 20 000 m². It was built in the years 1999–2000 by a company created by the BPH Bank and Mostostal Export Warsaw, especially for this purpose⁵. In 2002, the first office building opened in the suburban community of Zabierzów, which initiated a series of several Kraków Business Park facilities, now offering a total area of 75 000 m². At the beginning of the 21st century and in line with the dynamically developing firms of the new business service sector, western developers

² *Business Process Outsourcing* – firms offering specialized office services to other companies, chiefly in the area of finance, accounting and HR.

³ *Shared Service Centres* – centres offering shared services within a capital group, delocalizing some areas of the company's operation to other countries to benefit from qualified but cheaper workforce, chiefly in the IT, finance, accounting and client service area.

⁴ *Information Technology* – firms specializing in IT services.

⁵ The Lubicz Office Centre was originally designed as the headquarters for BPH Bank, hence its classical façade and monumental interiors – elements rarely seen in office buildings designed to let. However, after obtaining a building permit, BPH Bank withdrew its decision to house its headquarters in the building, so its interiors were re-designed as offices to let, without modifying the external appearance of the building and without changing the building permit conditions (design: Biuro Architektoniczne DDJM, Marek Dunikowski, Artur Jasiński, Jarek Kutniowski, Piotr Uherek, 1995–1998).



ISTNIEJĄCE BUDYNKI BIUROWE

- | | |
|-----------------------------------|--------------------------------|
| 1. Kraków Business Park Zabierzów | 11. Diamante Plaza |
| 2. Centrum Biurowe Euromarket | 12. Avatar |
| 3. Kompleks Biurowy GTC | 13. Quattro Business Park I&II |
| 4. Buma Square Business Park | 14. Vinci |
| 5. Bonarka 4 Business A&B, C&D | 15. Green Office A&B |
| 6. Centrum Biurowe Lubicz I&II | 16. Jasnogórska Mix |
| 7. Cracovia Business Centre | 17. Enterprise Park A&B |
| 8. Rondo Business Park | |
| 9. Centrum Biurowe Azbud | |
| 10. Centrum Biurowe Kazimierz | |

PLANOWANE BUDYNKI BIUROWE

- | |
|--------------------------------|
| 18. Green Office C |
| 19. Pascal |
| 20. Quattro Business Park IV |
| 21. Bonarka 4 Business II etap |
| 22. Enterprise Park C |
| 23. Consultronix Balice |
| 24. Alma Tower |
| 25. Skanska - Kapelanka |
| 26. Opolska Business Park |

Il. 1. Existing and designed office buildings in Kraków. Compiled by the Author

appeared in Kraków, e.g., GTC which built a new complex of office buildings (Newton-Galileo-Edison) on Armii Krajowej Avenue, covering a total area of over 30 000 m². In their vicinity, the Zasada Deweloper company built the “Mercedes” complex of office buildings in the years 1999–2000 and the Echo Investment company (Avatar) building in 2008–2010 which replaced the demolished seat of Hydrokop. This has now been entirely rented out to BNP Paribas.

The first decade of the 21st century was a period of prosperity for developers of office buildings in Kraków. Despite the economic slump in the years 2008–2009, several thousand square metres of new office space was made available on the market. In that period, another office building complex was built by GTC in the vicinity of the Kazimierz shopping centre (12 600 m², 2009), as well as many other office facilities, including, inter alia: Buma Square (28 000 m², 2006), Diamante Plaza (10 000 m², 2007), Rondo Business Park (7400 m², 2007–2008), Onyx (6000 m², 2008), CBL 2 (7,000 m², 2009), Da Vinci (20 000 m², 2011) and Bonarka 4 Business office park, comprising a total area of 33 200 m² (2009–2013). Among the largest office investment projects now underway is the Quattro Business Park which is being built by Buma. An area of nearly 50 000 m² of office space to let will soon be available in four buildings under this project. Rents in office buildings, which meet the requirements of BPO/SSC firms, range from about 13.50 to 14.50 EUR/m²/month. In the case of larger clients, developers are ready to offer extra packages or a period of release from rent [Ober Haus 2012, p. 9].

The new actor on the Kraków market is the Swedish developer Skanska, now building a 30 000 m² office building in the Kapelanka Street and planning other development projects.

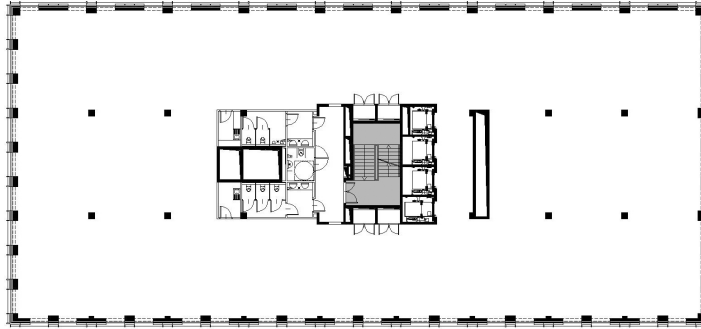
New sets of office buildings are being built on the edge of the City Centre (the Old Town itself being unfit for the development of large-size office buildings in view of its historic architecture, protected urban layout and inaccessibility to car transport), as well as in peripheral zones. A location is usually selected if it is a good address and has good traffic connections. In most cases, office buildings are built on brown field post-industrial plots. In many cases investment is hampered by the lack of local land-use plans, which is particularly troublesome, if the tenants need to modify their plans and thus obtain a new building permit or modify an existing one.

Recently, the trend for integrating office parks with large shopping centres has been seen. The GTC-built Kazimierz Shopping Centre and a complex of office buildings at the Bonarka Commercial Centre, built by the Hungarian developer Tri Granit can serve as examples in this respect. In the latter case, next to the already completed four office B4B buildings, more development covering an area of about 50 000 m² is planned. The combination of a large shopping centre with an office park, offers mutual synergic benefits; on work days, the office staff can use park grounds, shops, bars and restaurants at the shopping centre, bringing life to rather empty shopping centres during office hours, whilst at night and on free days, parking stalls for shoppers are made available. A large office building is also being planned near the Galeria Krakowska shopping centre, which itself offers over 5000 m² of office space. An inner city residential and commercial complex (the Lubicz Brewery) is now being built in the vicinity.

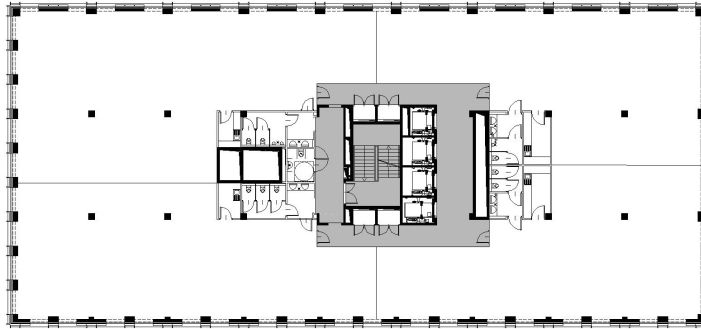
3. Characteristic features of office buildings to let

In the 1990s, there were no uniform standards for office buildings. An office building was considered A-class when: first it was situated on a main street; secondly – it had high class technological facilities, such as air conditioning, teletechnology and specialist low-voltage installations, including the BMS system, and “top-shelf” materials were used for its finish. This gap was filled only when, at the turn of 2008/2009, the Rolfe Judd Architecture and CB Richard Ellis consortium published *Modern Office Standards – Polska*, initially available in English and currently also in Polish. It is an industry recognized set of design guidelines and specifications for office buildings. Thanks to this, the standards have been harmonized and frequent misunderstandings and controversies between international partners of the investment process working on the basis of their own standards and traditions were eliminated. In addition to standardization, the standards, which were developed in cooperation with Poland’s largest office space developers, are aimed at ensuring the effectiveness of planning office space for rent.

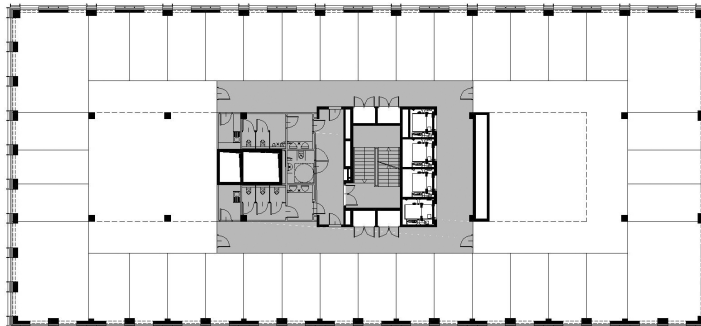
Modern Office Standards has set 20 qualitative and 3 location criteria, according to which buildings are classed A, B or C. To be classed A, the building must meet at least 17 qualitative criteria and to have an appropriate location. Detailed analysis of the standards brings interesting conclusions. For example, the first mandatory criterion is the building’s high-profile image, which can be ensured by its fine architectural design, particularly prominent location or simply its size dominating over the neighbourhood, and enhance the position of its tenant(s), visualized by the monumental emblem or the company’s logo on the building.



Rzut budynku biurowego w standardzie shell & core - wariant dla jednego najemcy na piętrze
(na szaro zaznaczono powierzchnie wspólne).



Rzut budynku biurowego w standardzie shell & core - wariant dla czterech najemców na piętrze
(na szaro zaznaczono powierzchnie wspólne).



Rzut budynku biurowego w standardzie shell & core - wariant dla wielu najemców na piętrze, układ korytarzowy
(na szaro zaznaczono powierzchnie wspólne).

II. 2. Variants of the floor layout depending on the number of tenants. The change of proportions between common spaces depending on the number of tenants is noteworthy. Compiled by the Author

In many countries, the designed module based on the 1.50 m × 1.50 m grid is considered to best suit the needs of office building planning, as it makes it possible to build the smallest office rooms, 3.00 metres wide (measured in module axes), whilst the main construction grid of the buildings is 9.00 × 9.00 m. In Poland, the optimal module is 1.35 × 1.35 m, which gives the module width of 2.70 m, so the frame structure of the building is planned on the 8.10 × 8.10 m grid. It meets the requirements for garage space (3 parking stalls between pillars and optimal planning of parking stall ranges and passages). The effective slab and column construction devoid of binding joist is also possible. Lower standards applicable to office rooms might be of little importance in Poland because most office spaces are *open plan*, so that workstations can be densely planned. In order to calculate the capacity of air conditioning systems, lift programming and calculating the width of emergency exits, it is assumed that the area for rent can offer 5–8 m²/person. In practice, these values are usually a little higher, but the “rescaling” of ventilation systems and wider up to standard emergency exit roads, will ensure higher comfort of work and security for people.

In Poland, the height of rooms in office buildings are a little below standard. The minimum nominal height for A-class buildings is 2.80 m from the floor to the ceiling (some investors even accept 2.70 m). Obviously, it is measured in the room when it is already finished. Considering the space for ceiling structures (installations which run over the ceiling and raised floors) the overall height of the floor in office buildings is usually well above three metres, generally measuring between 3.50–3.80 m (of course excluding the ground floor if commercial or catering services are envisaged). In this case the height of the interior of more than 3.0 m needs to be ensured (some investors even require 3.30 m).

4. Shell and Core design challenges

From the author’s experience of designing office space, it seems that the smaller and the more “local” the tenant’s firm is, the more likely the space rented is to be divided into a larger number of small rooms, micro-offices, irregular meeting rooms and cramped auxiliary annexes. Large international corporations are fond of open and transparent interior layouts, usually supplemented with a few rooms for the management staff, glazed conference rooms and more cozy rest and refreshment rooms. Naturally, in the case of the open-plan model, the effectiveness of the use of space is higher and the cost of adapting the office space to the tenant’s needs is reduced. This is why office space developers spare no effort to attract large western companies as tenants and are reluctant to construct cellular layouts designated for smaller tenants. The use of an office building occupied by small companies, where the tenants’ rotation is rather high, large numbers of visitors and constant remodelling of the offices differ from the building with large, corporative and usually stable tenants.

The inadequate number of parking stalls is a common problem when office buildings are constructed in Kraków, which results in overcrowding the neighbouring streets with the parked cars of employees. In most cases, for A-class buildings one parking stall is planned per 50 m² of office space. This standard results from the optimization of the usually high costs of building underground garages for the needs of a relatively small number of management staff, as companies are only ready to hire expensive garage stalls for the management. For a corporation employees, having their own garage stalls has a double meaning: functional,

as it gives them fast and convenient transport access to work, and that of a status symbol – testifying to their high position in the company.

Theoretically, other employees should go to work by bike or public transport. But in practice it is totally different: there are 5–10 employees per 50 m² of office space and they usually have cars. Due to the intensive work schedule the corporation imposes on its staff, they are constantly in a hurry to meet their family obligations, so they are generally forced to go by car if they want to drop off their children to kindergarten or to school on the way, to do the shopping, etc. This leads to the situation in which the streets around large office buildings, even if well connected with public transport, are crammed with parked cars. As it happens, some people hurrying for a meeting just leave their cars wherever they can, thus increasing traffic chaos. Hence, moving the office function outside the overcrowded inner city districts and combining office complexes with shopping centres, where the deficit of parking stalls can be overcome thanks to underground garages, is advisable.

A prevailing trend which is now seen in the Kraków market is the certification of office buildings which should achieve LEED⁶ (Gold) or BREEAM⁷ (Very Good) levels. This is connected with increasing corporate awareness and responsibility among both developers and tenants. International outsourcing companies which are leading clients in Kraków's real estate market of office space “go green”, preferring energy efficient and environmentally friendly projects. Certification is more than a marketing tool and a method to meet environmental protection requirements; certified, energy efficient buildings bring the tenant long-term economic benefits in the form of lower utility bills. According to the report, *Going Green in Eastern Europe*, modern office buildings will have to be “green” and sustainable, and energy efficiency will soon become a legal requirement [Jones Lang LaSalle 2012].

The main challenge for the designer of office buildings to let, is how to conciliate the investor's requirements to have an adequate return on investment, with the universality and flexibility of design to meet the diverse needs of future tenants. Design standards are becoming more precise and there is increasingly greater awareness of office space developers' and tenants' needs, which helps to meet sometimes conflicting goals. In view of the competition in the market of properties for rent and the striving for maximum profit, developers are forced to optimize the use of their property. These activities run in parallel: the maximization of the area for rent, reducing the investment cost and tightening its timeframes. In other words, the developer will always try to achieve maximum profit at minimum cost. Certainly, the success of an office building project does not depend only on the cost and time of its development. The investment's success depends on the building's success in terms of lease, which in turn depends on meeting the needs of prospective tenants.

Unfortunately, designers are unable to foresee the number and the type of requests prospective tenants may have, so they should be striving for project optimization, first of all by ensuring the high effectiveness and flexibility of the space to let. This can be achieved when the floor area can be flexibly divided between several tenants, whilst the planning of service risers and common space remains the same: through the use of routes which allow enough daylight at work stations and the planning of office space depending on the strategy

⁶ The LEED (*Leadership In Energy and Environmental Design*) certification programme was created by the U. S. Green Building Council in 2000.

⁷ The British certification programme: BREEAM (*Building Research Establishment Environmental Assessment Method*) was launched in 1990.



II. 3. *Shell and Core* office building – before the interior was arranged by the tenant (Photo from the archive of the Artur Jasiński i Wspólnicy design office)



II. 4. *Shell and Core* office building – after the interior was arranged for the tenant (open-space model) (Photo from the archive of the Artur Jasiński i Wspólnicy design office)

of lease (corridor, open-space or mixed model), through the maximum simplification of constructions and installations (regular construction and functional grids, modular and well-planned installation systems). The studies of planning options for the space to let, which are already developed at the initial phases of design work and verify the assumptions as to the functionality and space in view of the various layouts needed by tenants and various renting strategies, are useful for the project's optimization. It needs to be noted that the client's striving for prestige and quality of architecture in A-class, offers a little more space for the designer's creativity to give the architecture its individual expression, usually with regard to the building façade and common space detail, and with special stress on the entrance hall and reception, which may be the smallest in terms of area, but nevertheless the most representational interiors of the office building. The design and furnishing, of the remaining, several times larger part of the building, will be up to the future tenants.

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