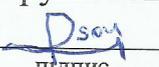


Міністерство освіти і науки України  
Національний університет «Полтавська політехніка імені Юрія Кондратюка»  
Навчально-науковий інститут архітектури, будівництва та землеустрою  
Кафедра архітектури будівель та дизайну

## АРХІТЕКТУРА ТОРГОВЕЛЬНИХ ЦЕНТРІВ У КОРОЛІВСТВІ МАРОККО (НА ПРИКЛАДІ М. КЕНІТРА

Пояснювальна записка  
до кваліфікаційної роботи  
на здобуття ступеня вищої освіти «магістр»  
за спеціальністю 191 «Архітектура та містобудування»  
(освітня програма «Архітектура будівель і споруд»)

602-АБі 11572620 ПЗ

Розробив студент групи 602-АБі  
15 січня 2025 р.  Ель Рхайті А.С.  
підпис

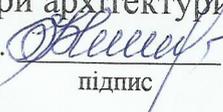
Керівник кваліфікаційної роботи  
15 січня 2025 р.  Дмитренко А.Ю.  
підпис

Консультант з архітектурних конструкцій  
15 січня 2025 р.  Семко О.В.  
підпис

Консультант з інженерного  
благоустрою і транспорту  
15 січня 2025 р.  Дмитренко А.Ю.  
підпис

Консультант з інтер'єру  
15 січня 2025 р.  Дмитренко А.Ю.  
підпис

Допустити до захисту

Завідувач кафедри архітектури будівель та дизайну  
16 січня 2025 р.  Ніколаєнко В.А.  
підпис

Ministry of Education and Science of Ukraine  
National University "Yuri Kondratyuk Poltava Polytechnic"  
Educational and Research Institute of Architecture,  
Civil Engineering and Land Management  
Department of Architecture of Buildings and Design

## ARCHITECTURE OF SHOPPING MALLS IN THE KINGDOM OF MOROCCO (ON THE EXAMPLE OF KENITRA)

Explanatory note  
to the qualification work  
for obtaining a higher education degree "Master"  
in specialty 191 "Architecture and Urban Planning"  
(educational program "Architecture of Buildings and Structures")

601-AB 11572620 EN

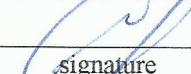
Developed by a student of group 602-ABi

15 of January 2025  El Rhaiti A.S.  
signature

Supervisor of the qualification work

15 of January 2025  Dmytrenko A.Yu.  
signature

Consultant on architectural structures

15 of January 2025  Semko O.V.  
signature

Consultant on engineering  
improvements and transport

15 of January 2025  Dmytrenko A.Yu.  
signature

Consultant on interior

15 of January 2025  Dmytrenko A.Yu.  
signature

**Admit to the presentation**

Head of the Department of Architecture of Buildings and Design

16 of January 2025  Nikolaienko V.A.  
signature

## CONTENT

ASSIGNMENT FOR QUALIFICATION WORK .....	4
LIST OF ILLUSTRATIONS AND DRAWINGS .....	5
GENERAL PROVISIONS .....	7
1. RESEARCH PART .....	9
1.1. The concept of a shopping mall.....	9
1.2. The history of shopping malls .....	10
1.3. Classification of shopping centres .....	21
1.4. Functional structure of shopping malls .....	24
1.5. Shopping malls in the Kingdom of Morocco .....	29
1.6. Recommendations for the design of shopping malls in Morocco .....	38
2. ARCHITECTURAL AND PROJECT PART.....	41
2.1. Urban planning solution .....	41
2.2. Solution of the shopping mall site's master plan.....	44
2.3. Architectural and planning solution of the shopping mall .....	47
2.4. Security and inclusion of the shopping mall .....	51
2.5. Engineering equipment of the shopping mall .....	55
3. ARCHITECTURAL STRUCTURES .....	57
3.1. General description of the building .....	57
3.2. Main structural elements of the building.....	58
4. ENGINEERING IMPROVEMENTS AND TRANSPORT .....	70
5. INTERIOR .....	74
5.1. The main idea of organizing the interior space of the shopping mall .....	74
5.2. Interior elements.....	75
5.3. Colour solution.....	75
5.4. Lighting .....	76
5.5. Furniture and equipment .....	76
REFERENCES .....	77

	Surname, initials	Signature	Date	602-ABi 11572620 EN			
Developed by	El Rhaiti A.S.		15.01.24	Explanatory note	Stage	Sheet	Sheets
Supervisor	Dmytrenko A. Yu.		15.01.24		DW	3	81
Consultant	Semko O.V.		15.01.24		National University "Yuri Kondratyuk Poltava Polytechnic"		
Consultant	Dmytrenko A. Yu.		15.01.24				
Consultant	Dmytrenko A. Yu.		15.01.24				
Head of the Department	Nikolaienko V.A.		16.01.24				

Інститут, факультет, відділення Навчально-науковий інститут архітектури,  
будівництва та землеустрою

Кафедра архітектури будівель та дизайну

Рівень вищої освіти магістр

Спеціальність 191 «Архітектура та містобудування»  
(шифр і назва)

Освітня програма «Архітектура будівель і споруд»  
(назва)

ЗАТВЕРДЖУЮ

Завідувач кафедри архітектури  
будівель та дизайну

  
(підпис)

В.А. Ніколаєнко  
(ініціали, прізвище)

«28» жовтня 2024 року

## ЗАВДАННЯ НА КВАЛІФІКАЦІЙНУ РОБОТУ СТУДЕНТУ

Ель Рхайті Алі Сухайл

(прізвище, ім'я, по батькові)

1. Тема роботи Архітектура торговельних центрів у Королівстві Марокко (на прикладі м. Кенітра) / Architecture of Shopping Malls in the Kingdom of Morocco (on the Example of Kenitra)

керівник роботи Дмитренко Андрій Юрійович, кандидат технічних наук, доцент,  
(прізвище, ім'я, по батькові, науковий ступінь, вчене звання)

затверджені наказом закладу вищої освіти від «09» серпня 2024 року № 818-ф.а

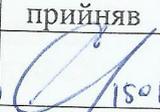
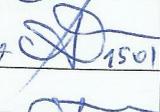
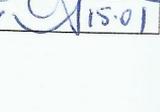
2. Строк подання студентом роботи 17 січня 2025 р.

3. Вихідні дані до роботи генеральний план міста Кенітра (Королівство Марокко)

4. Зміст розрахунково-пояснювальної записки (перелік питань, які потрібно розробити) 1) Науково-дослідницька частина (визначити прийоми проектування об'єкту на основі аналізу теорії та практики); 2) Архітектурно-проектна частина (описати містобудівні, функціонально-планувальні та архітектурно-композиційні рішення); 3) Архітектурні конструкції (описати інженерно-конструктивні рішення); 4) Інженерний благоустрій території та транспорт (описати інженерний благоустрій ділянки об'єкта та розрахунок парковок); 5) Інтер'єр (описати основні вирішення щодо функціонального та образного вирішення внутрішнього простору).

5. Перелік графічного матеріалу (з точним зазначенням обов'язкових креслень) Ілюстративний матеріал до науково-дослідницької частини роботи (до 25-30% від загального обсягу графічної експозиції), ситуаційна схема розташування об'єкта, опорний план ділянки проектування (М 1:1000 – 1:500), генеральний план (М 1:1000 – 1:500), плани поверхів (М 1:100 – 1:200), розріз (и) (М 1:100 – 1:200), фасади (М 1:100 – 1:200), загальний вигляд будівлі (перспективне зображення), перспективне зображення інтер'єру.

## 6. Консультанти розділів проекту (роботи)

Розділ	Прізвище, ініціали та посада консультанта	Підпис, дата	
		завдання видав	завдання прийняв
Архітектурні конструкції	Семко О.В., завідувач кафедри будівництва та цивільної інженерії	 28.10	 15.01
Інженерний благоустрій і транспорт	Дмитренко А.Ю., доцент кафедри архітектури будівель та дизайну	 28.10	 15.01
Інтер'єр	Дмитренко А.Ю., доцент кафедри архітектури будівель та дизайну	 28.10	 15.01

7. Дата видачі завдання 28 жовтня 2024 р.

## КАЛЕНДАРНИЙ ПЛАН

№ з/п	Назва етапів кваліфікаційної роботи	Строк виконання етапів роботи	Примітка
1	Початок виконання кваліфікаційної роботи. Видача затверджених кафедрою бланків завдання на кваліфікаційну роботу.	28.10.2024	
2	Розроблення ескіз-ідей містобудівного, планувального і об'ємно-просторового вирішення об'єкту проектування.	28.10.2024 – 01.11.2024	
3	Затвердження та захист ескіз-ідеї містобудівного, планувального і об'ємно-просторового вирішення об'єкту проектування.	04.11.2024 – 08.11.2024	
4	Розроблення ескізу. Написання пояснювальної записки.	11.11.2024 – 29.11.2024	
5	Кафедральна перевірка: попереднє узгодження креслень ескізу по об'єкту проектування комісією кафедри. Початок процесу перевірки на плагіат пояснювальної записки.	02.12.2024 – 06.12.2024	
6	Робота над ескізом. Консультація за розділами: архітектурні конструкції, інженерний благоустрій території і транспорт та ін. Доопрацювання ескізу за зауваженнями.	02.12.2024 – 20.12.2024	
7	Робота над ескізом, пояснювальною запискою. Виконання розрахунків. Перевірка на плагіат пояснювальної записки.	16.12.2024 – 20.12.2024	
8	Кафедральна перевірка: затвердження ескізу комісією кафедри. Допуск до подальшої роботи. Доопрацювання проекту за зауваженнями комісії. Перевірка на плагіат пояснювальної записки.	23.12.2024 – 27.12.2024	
9	Робота над ескізом, пояснювальною запискою. Виконання розрахунків. Виконання та затвердження відповідних розділів проекту консультантами. Перевірка на плагіат пояснювальної записки.	28.12.2024 – 05.01.2025	
10	Міжкафедральна перевірка: перегляд стану кваліфікаційної роботи комісією. Затвердження відповідних розділів роботи консультантами. Доопрацювання роботи за зауваженнями.	06.01.2025 – 10.01.2025	
11	Завершення перевірки пояснювальної записки на плагіат.	17.01.2025	
12	Рецензування. Отримання рецензії.	13.01.2025 – 17.01.2025	
13	Здавання роботи і пояснювальної записки на кафедру. Допуск до захисту. Попередній захист.	13.01.2025 – 17.01.2025	
14	Захист кваліфікаційної роботи в ЕК. Підсумки захисту атестаційних робіт в ЕК.	20.01.2025 – 24.01.2025	

Студент

(підпис)



Ель Рхайті А.С.  
(прізвище та ініціали)

Керівник роботи

(підпис)



Дмитренко А.Ю.  
(прізвище та ініціали)

## SCHEME OF DIVISION OF GRAPHIC EXPOSURE ON SHEET

Sheet 1

### LIST OF ILLUSTRATIONS AND DRAWINGS

Sheet	Name	Note
1	Morocco Mall in Casablanca. Aerial view at night	
1	Morocco Mall in Casablanca. Interior view	
1	Morocco Mall in Casablanca. Interior view in atrium	
1	Interior of the underground parking	
1	Morocco Mall in Casablanca. Schematic ground floor plan combined with site masterplan	
1	Morocco Mall in Casablanca. Schematic axonometry	
1	Carré Eden shopping mall in Marrakesh. Axonometry	
1	Carré Eden shopping mall in Marrakesh. View from Rue Mohamed V	
1	Carré Eden shopping mall in Marrakesh. Interior view 1	
1	Carré Eden shopping mall in Marrakesh. Interior view 2	
1	Carré Eden shopping mall in Marrakesh. Interior view 3	
1	The major spaces and activities in shopping mall	
1	Scheme of the visitors and personnel movement inside the shopping mall	
1	Distribution of functional spaces horizontally in a shopping mall	



## GENERAL PROVISIONS

Qualification work for obtaining the degree of higher education "Master" in specialty 191 "Architecture and Urban Planning" (educational program "Architecture of Buildings and Structures") is developed following the requirements of the academic and professional program "Architecture of Buildings and Structures" of the second (master's) level of higher education in the field of knowledge 19 Architecture and Construction specialty 191 "Architecture and Urban Planning" educational qualification "Master of Architecture and Urban Planning". . Following the requirements of the educational and professional program, the qualification work involves solving a complex specialized practical problem in the field of architecture of buildings and structures and is an architectural project with an explanatory note.

The composition, content, and scope of the qualification work meet the requirements of the relevant methodological guidelines for the implementation and design of the master's qualification work in specialty 191 "Architecture and Urban Planning" for students studying in the educational program "Architecture of Buildings and Structures" of the second (master's) level of full-time higher education [1].

**Relevance of the topic.** The relevance of the topic of the qualification work "Architecture of Shopping Malls in the Kingdom of Morocco (on the Example of Kenitra)" is determined by the specifics of the research object. The shopping mall not only plays a significant role in saving the time of the visitor, who can purchase various goods and services in one place, combining shopping with entertainment. Such an activity has even received a special name *retailtainment* [2]. In addition, shopping malls contribute to the revival of trade, and an increase in the volume of paid services provided and thus contribute to the revival of the local economy. At the same time, additional jobs are created, which helps to overcome social problems. It should be understood that shopping centers still belong to the service sector and by themselves, without production, foreign trade, or other sources of income, cannot ensure economic growth. In the Kingdom of Morocco, shopping malls are

					602-ABi 11572620 EN	Sheet
Change	Sheet	Document No.	Signature	Date		7



# 1. RESEARCH PART

## 1.1. The concept of a shopping mall

Today, *shopping malls* (also known as shopping centres) are an integral part of modern consumer culture. These establishments offer a wide range of goods and services by combining shops, restaurants, and entertainment venues within a single building, thus providing not only convenience and time savings, but also an exciting experience for visitors.

The development of suburbs and the increasing number of cars in the United States in the mid-20th century contributed to the emergence of the shopping mall concept.

These establishments became true service centres for the suburbs, combining restaurants, shops, and entertainment. The internal structure of shopping malls is characterized by a combination of large department stores or retail chains that attract significant flows of visitors, the so-called *anchors*, and smaller specialty stores, boutiques, and service providers that expand the selection of goods and services.

Modern shopping malls are becoming more than just places to shop, they are also vibrant social hubs, places to relax and have fun. Many of them have food courts, cinemas, play areas for children, and even public meeting places. Thanks to this diversified strategy, shopping complexes are becoming more profitable and at the same time more beneficial for the development of local communities.

Over time, the layout and design of shopping malls have undergone significant changes. To meet changing consumer tastes and market needs, shopping malls have constantly evolved, from rows of stores along shopping streets to the enclosed, modern, climate-controlled shopping centres of today.

Despite the constant evolution of the retail industry, shopping malls continue to play a crucial role in the consumer experience, as they provide convenience, variety, and a sense of community that no online stores can match.

## 1.2. The history of shopping malls

Various researchers agree that the United States of America should be considered the birthplace of shopping malls in their modern sense. One of the forefathers of shopping malls in the United States can be considered Henry Ford, who first managed to establish mass production of relatively inexpensive cars. The famous black Ford-T made the suburbs of large cities accessible and contributed to their development and the relocation there of both housing and service facilities.

The first period of shopping malls' development lasted from approximately 1924 to 1945. Their first wave in the United States were open-air shopping centres, i.e., rows of stores on either side of shopping streets that attempted to recreate the structure of historically established shopping streets in the historic centres of large cities. The vast majority of these malls were built to attract people to newly developed suburbs or small towns and were seen by developers not so much as a source of income as a magnet for potential buyers of residential real estate. After the construction of shopping centres, the demand for land around them and, accordingly, their prices increased significantly. The first shopping centre of this type was Country Club Plaza, built by J.C. Nichols Company and opened in 1924 (Fig. 1.1).



Fig. 1.1. Country Club Plaza in Kansas City, Missouri (1925)

										Sheet
										10
Chang	Sheet	Document No.	Signature	Date						







Fig.1.4. Two-level shopping arcades surround a shopping street that ends with an anchor department store of the Jordan Marsh & Company chain



Fig. 1.5. The Northland Center in Michigan (1954). An aerial view

Chang	Sheet	Document No.	Signature	Date

602-ABi 11572620 EN

Sheet

13





The third period in the development of shopping malls began in 1956 and continues to this day. It was initiated by the author of the modern mall concept, an Austrian-American architect Victor David Gruen, born Viktor David Grünbaum [4] (July 18, 1903 – February 14, 1980). Victor Gruen designed the first indoor shopping mall with internal climate control – The Southdale Center, which opened in 1956 in the Minneapolis suburb of Edina, Minnesota. The internal microclimate of the shopping mall created comfortable conditions all year round for gatherings of bargain hunters, family vacations, and teenage gatherings. The compositional center of the internal communication space was a three-story garden with tall eucalyptus and magnolia trees, as well as two huge metal sculptures by American artist Harry Bertoia. This space also included a bird aviary and was a frequent venue for art and other types of exhibitions (Fig.1.7).

The main idea of organizing the internal space was to make it as difficult as possible for the visitor to move inside and to prolong his stay inside the mall. It was based on a theory developed by Victor Gruen, called the Gruen Transfer (or the Gruen Effect).



Fig. 1.7. The interior of The Southdale Center (Edina, Minnesota) with a three-story garden court. Architect V. Gruen, 1956

									Sheet
									16
Chang	Sheet	Document No.	Signature	Date					





first pedestrian mall and introduced the concept of car-free zones within city centres. [8] These European pedestrian malls were usually formed based on a historically established network of squares, streets, and other urban spaces in the city centre.

The creation of these modernized pedestrian malls in the city center not only helped to increase sales but also to reduce traffic congestion caused by the influx of cars. [8] This "modern" idea of separating traffic and pedestrian traffic influenced American pedestrian malls, although until then, Americans had rarely referenced or replicated genuine European ideas in their mall designs.

Americans built shopping malls on vacant lots to revitalize suburbs, unlike Europeans who used existing urban infrastructure to create pedestrian malls that enhanced the commercial function of the city centre [9]. The economic growth of the suburbs led to the creation of stand-alone structures, such as shopping malls, and this narrowed the evolution of American pedestrian malls [7].

American pedestrian malls incorporated some elements borrowed from similar European malls: drinking fountains, benches for relaxation, and a distinct sense of enclosed, intimate space [10].

The problems of the American shopping mall were largely related to its traffic bypass. Designed as a street, in practice it turned into a freeway that skirted the designed facility, preventing connections between it and the surrounding residential areas. Jane Jacobs [11] argues that Gruen's urban development projects can only be realized with a drastic reduction in the number of cars because otherwise the planned parking spaces simply would not be enough.

American pedestrian malls incorporated some elements borrowed from similar European malls: drinking fountains, benches for relaxation, and a distinct sense of enclosed, intimate space [10].

The problems of the American shopping mall were largely related to its traffic bypass. Designed as a street, in practice it turned into a freeway that skirted the designed facility, preventing connections between it and the surrounding residential areas. Jane Jacobs [11] argues that Gruen's urban development projects can only be

realized if the number of cars is drastically reduced, otherwise the planned parking spaces simply would not be enough.

William H. Whyte [12] generally describes the main reason for the failure of pedestrian malls as “too much space for too little activity” – in other words, most malls are simply too large and out of proportion to the human scale. According to Jeffrey Hardwick [13], even Victor Gruen, the mall creator, eventually concluded that his shopping center had failed because of “the ugliness and discomfort of the land-wasting seas of parking [...] and shopping centers focused too much on retailing and left out other community functions.” In other words, the entire communicative function began to be built around shopping, ignoring other types of human leisure activity.

It is clear that cities will continue to develop in urban terms in the future, and that the revitalization of suburbs cannot be achieved by building new city centers dedicated exclusively to shopping. The typology of shopping centers developed in response to the demand to limit urban sprawl, which led to huge buildings combined with large parking lots. These buildings often undermined the previously existing physical framework of the metropolitan area, eliminating the possibility of truly orderly community life. The road system, instead of connecting different areas of the city, became an obstacle to pedestrian connections, and the large number of cars in the city simply did not fit in the designed parking lots. American shopping malls in city centers simply sucked out all the remnants of business activity from them, adding dilapidated city centers to the neglected suburbs.

It should be understood that in the United States, shopping malls have gone the longest way of development, gradually crushing the retail market and creating more and more mutual competition [14 – 17]. In other markets, especially those that are currently experiencing a period of growth, the development of malls may occur in parallel with a certain decline in them in the United States. Nothing is surprising in this, because local conditions are significantly different. Therefore, for example, in the Kingdom of Morocco, malls can now be considered a progressive type of retail establishments.

										Sheet
										20
Chang	Sheet	Document No.	Signature	Date						

### 1.3. Classification of shopping centres

The shopping centres can be classified by different features: market area, size, set and number of anchor tenants, configuration, focus, ownership and merchandising etc. Today, one of the most authoritative and widely used classifications of shopping centers is the classification of the International Council of Shopping Centers (ICSC). This classification takes into account the characteristics of individual countries and regions and has its own specifics for individual countries and regions (USA, EU, United Kingdom, Australia, etc.).

According to the ICSC definition [18], shopping centers are divided into malls and strip centers by configuration.

**Malls** are usually enclosed buildings with internal climate control, with internal pedestrian paths between the retail and service establishments located on both sides of them. As a rule, most regional and super-regional centers are malls, so this term has become an informal term for these types of shopping centers.

**Strip center** is a row of blocked stores/service establishments that are operated as a single retail enterprise. Parking spaces are usually located in front of the stores. The defining feature of a strip center is the pedestrian communication between the stores under the open sky. Storefronts may be interconnected by canopies. Strip centers can be arranged in a straight line or have an “L” or “U” shape.

According to the ICSC classification, shopping centers are divided into 8 types, 2 of which (Regional Center (area – 35÷75 thousand m<sup>2</sup>) and Super Regional Center (area >75 thousand m<sup>2</sup>) are usually closed malls, and 6 are types of strip centers with open pedestrian communications (Neighborhood Center, Community Center, Lifestyle Center, Power Center, Theme/Festival Center, Outlet Center). In practice, shopping centers are often a combination of several types.

**Neighborhood Center.** This is designed to meet the daily needs of consumers living near the center. According to ICSC statistics, in about half of cases, the anchor is a supermarket, and in about a third of cases, a pharmacy. These anchors are complemented by smaller establishments offering pharmaceutical and health-related





## 1.4. Functional structure of shopping malls

In the structure of shopping malls, four main functional spaces are distinguished: public zone, retail, parking and services. The activities that are localized in each of these spaces are shown in Fig. 1.9.

Space	leisure	shopping	Management
Public zone	✓	✗	✗
Retail	✗	✓	✗
Parking	✗	✗	✓
Services	✓	✗	✓

Fig. 1.9. The major spaces and activities in shopping mall

With the advent of multi-level shopping malls, the problem of the correct distribution of functional spaces on different levels of the building arose. Taking into account the Gruen Effect, the most attractive spaces for visitors should be located in such a way that on the way to them visitors had to pass by less attractive establishments and thus ensure an acceptable level of their attendance.

In addition, experience shows that the first level is optimal for placing retail establishments. Buyers are very reluctant to go down or up, therefore, in order to encourage them, shopping malls should be equipped with a vertical transport (most often escalators, although elevators are also found), as well as anchors should be placed on levels other than the first. The recommended distribution of functional spaces vertically is shown in Fig. 1.10.

The same principle applies to the horizontal arrangement of different functional spaces on the floor plan. It is advisable to place anchors as far away from

entrances and vertical communications as possible, so that visitors pass by as many secondary tenants as possible on their way to the anchors and have opportunities for spontaneous purchases (Fig. 1.11).



Fig. 1.10. Distribution of functional spaces vertically in a shopping mall



Fig. 1.11. Distribution of functional spaces horizontally in a shopping mall

A food court is one of the most attractive elements of a shopping mall and could serve as an anchor.

In a typical food court, eateries (café, restaurants, bistros, etc.) run next to one another, surrounding a central dining area. The secret of the food court's appeal to visitors lies in the wide selection of dishes and cuisines – from national to global franchises such as McDonald's.

Various combinations of the mutual location of the food court and internal communications are shown in Fig. 1.12.

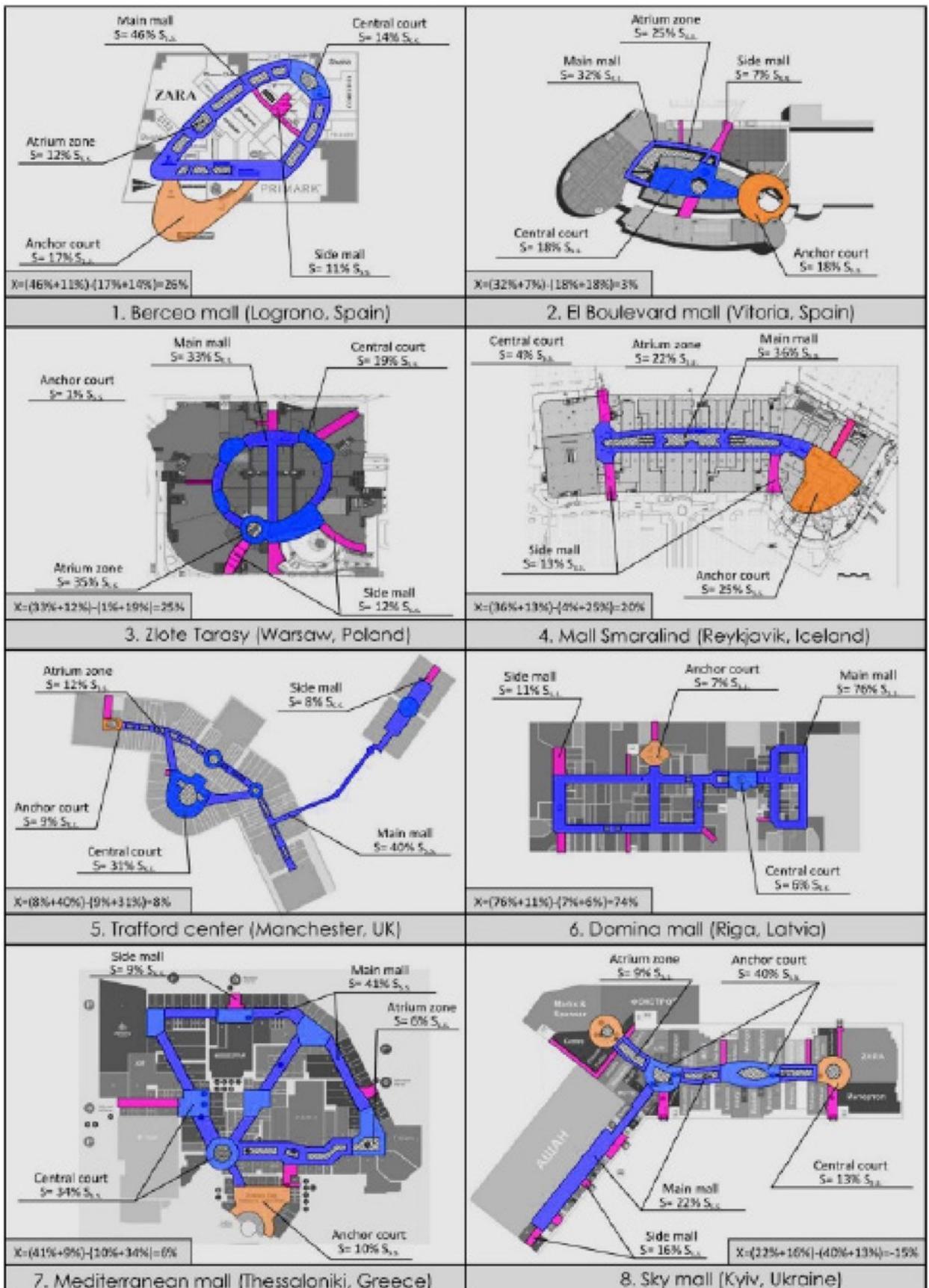


Fig. 1.12. Various combinations of the mutual location of the food court and internal communications in a shopping mall

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------

Proper organization of the circulation of visitors and staff plays a key role in the effective functioning of shopping malls (Fig.1.13). It is strongly influenced by the number and location of anchors (Fig.1.14).

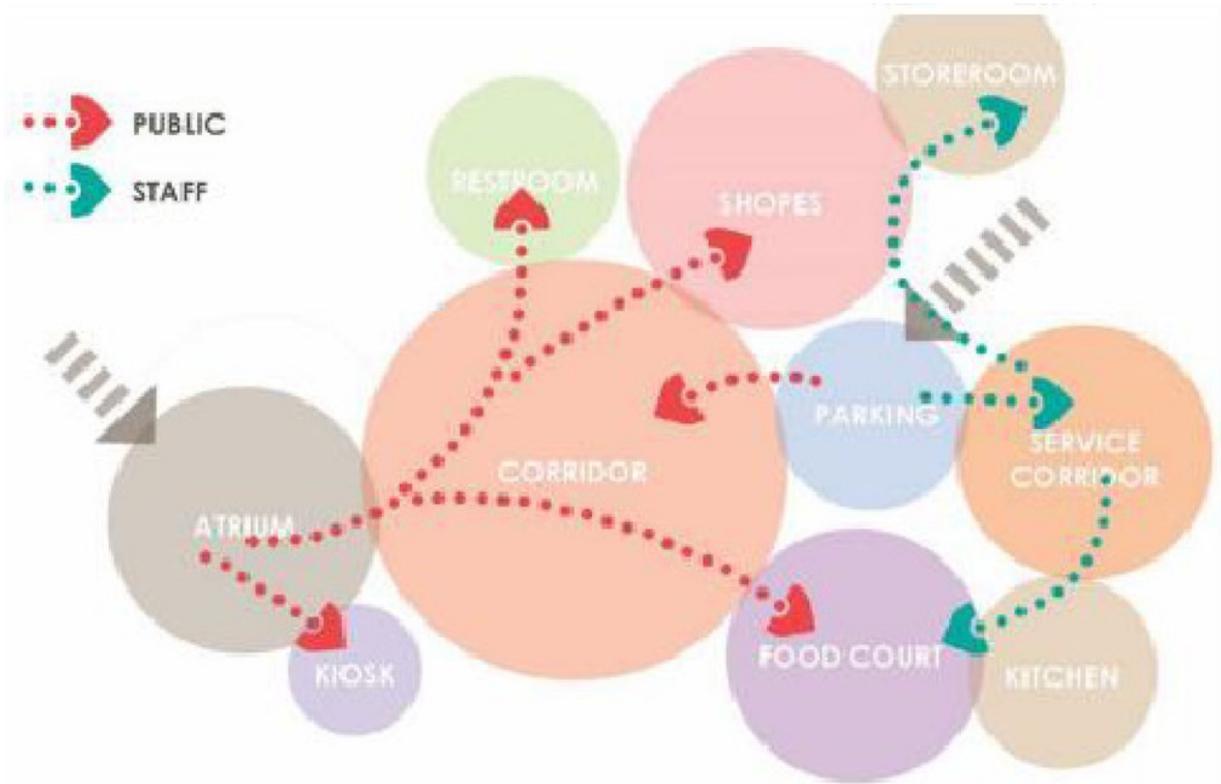


Fig. 1.13. Scheme of the visitors and personnel movement inside the shopping mall

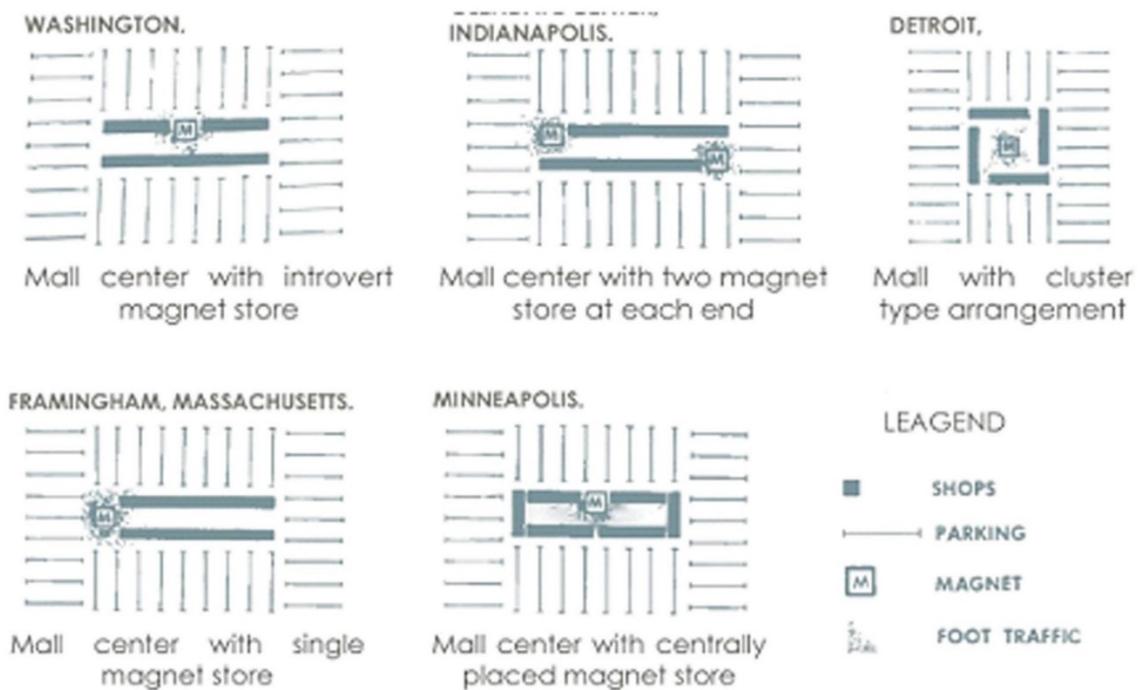


Fig. 1.14. Anchor placement options in the structure of a shopping mall

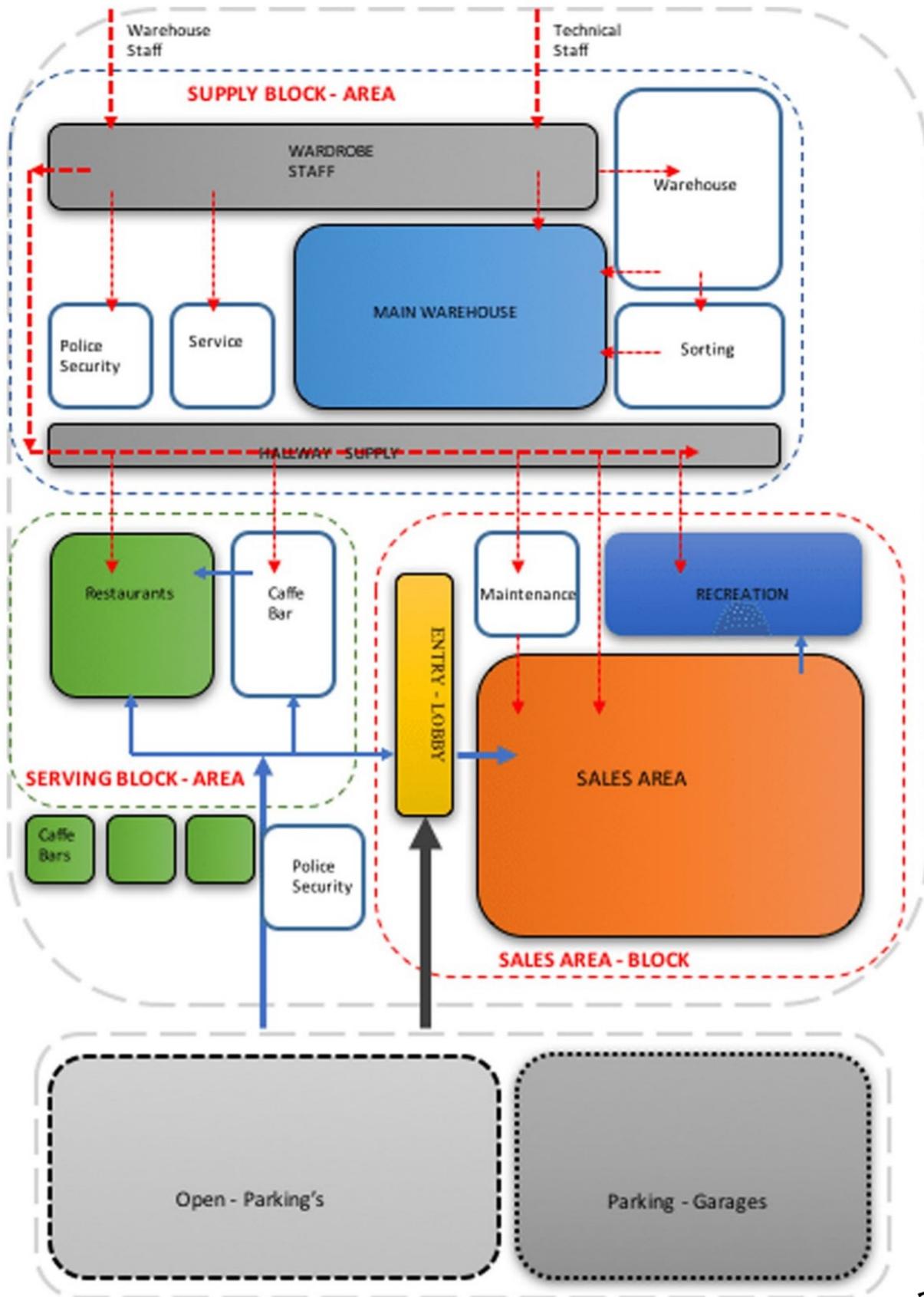


Fig. 1.15. Scheme of functional links of the shopping mall

Chang	Sheet	Document No.	Signature	Date

## 1.5. Shopping malls in the Kingdom of Morocco

The evolution of shopping malls in Morocco began later than in the Western world and, influenced by local cultural, economic, and social factors, has developed along a somewhat different trajectory. Rapid urbanization, the growth of the middle class and the general well-being of the population have led to a significant demand for space for the placement of trade, service and entertainment establishments, as well as for places where one could spend free time, relaxing shopping and entertainment. Shopping malls in Morocco have become symbols of economic development and social hubs.

The first shopping malls in Morocco appeared in the late 20th and early 21st centuries. Among them are Marjane Mall and Almazar Mall in Marrakech and Marrakech City Center in Casablanca, which have become some of the most famous retail destinations in the country.

The anchors of these first shopping malls were usually large supermarkets and local representatives of major international brands, while a wide range of goods and services for visitors was provided by smaller local shops, cafes and restaurants. Later, the functions of the malls were supplemented by the entertainment sector, which included cinemas, play areas for children and even indoor amusement parks. Shopping remained the main activity, but emotions and experiences became the main products that shopping malls offered to visitors.

Moroccan shopping mall architecture often combines modern design elements with traditional Moroccan aesthetics, helping to create a sense of place and identity while catering to global tastes and trends. This is especially noticeable in cities with a rich architectural heritage, such as Marrakech, where local architectural motifs – distinctively shaped arches, mosaics, intricate patterns – are increasingly integrated into both the interior and exterior of shopping malls.

In recent years, with the development of the tourism industry in Morocco and the growth of tourist flows, primarily from France, the Middle East and Sub-Saharan Africa, shopping malls have become increasingly oriented towards tourists, while at

										Sheet
										29
Chang	Sheet	Document No.	Signature	Date						

the same time becoming an important element of tourist attraction along with local culture, nature, architectural monuments, and national cuisine.

The role of shopping centres has also changed within the country. The country's population is constantly increasing the share of young, wealthy, fairly well-educated urban residents, for whom shopping centers, especially in cities such as Casablanca, Rabat, and Marrakech, are becoming places for communication, leisure, and cultural events.

Moroccan shopping malls also reflect broader trends in the Maghreb, such as a growing interest in sustainable development and green building practices. To meet these demands, developers and architects are constructing new shopping malls as energy-efficient buildings, using environmentally friendly materials and renewable energy sources.

The following is a description of the most significant trading malls in the Kingdom of Morocco.

Morocco Mall is located in Casablanca, Morocco's largest city, near the Ain Diab waterfront, overlooking the Atlantic Ocean and providing easy access for both locals and tourists (Fig. 1.16).

Morocco Mall has multiple levels that include retail, restaurants, cafes, and entertainment areas (Fig. 1.17). Located in the center of the building, a large atrium is a locational center and functional center of the interior space, providing both functional and visual connectivity between the different interior levels.

Characteristic features of the architectural and compositional solution of Morocco Mall are the combination of modern aesthetics with elements that reflect Moroccan culture.

The feeling of openness and spaciousness dominates both the exterior and the interior of the shopping center. Huge glass facades allow daylight into the shopping mall during the day, and at night turn the building into a kind of magic lantern. The building, designed as an iconic, intended to become one of Casablanca's landmarks, is visually impressive both day and night (Fig. 1.18). It forms the so-called sea facade of the city.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		30

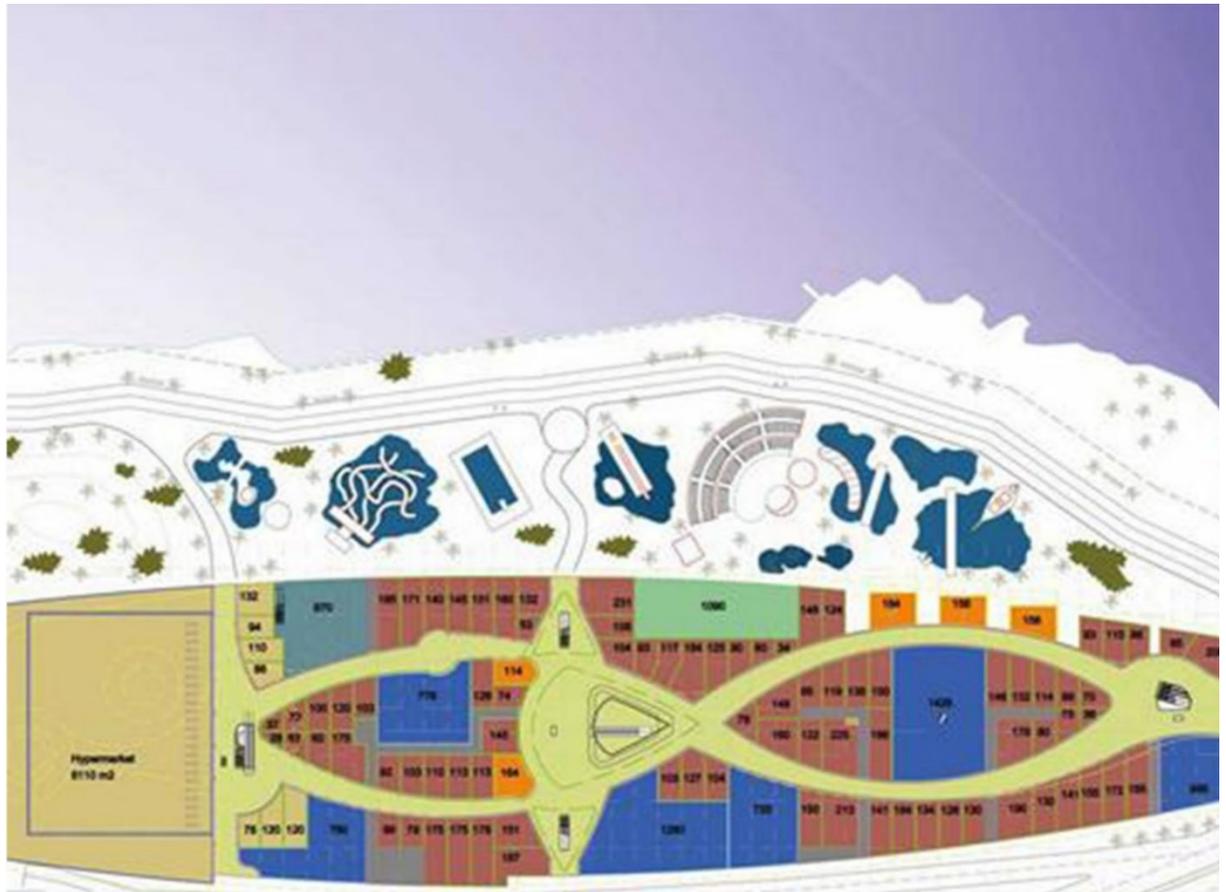


Fig. 1.16. Morocco Mall in Casablanca. Schematic ground floor plan combined with site masterplan

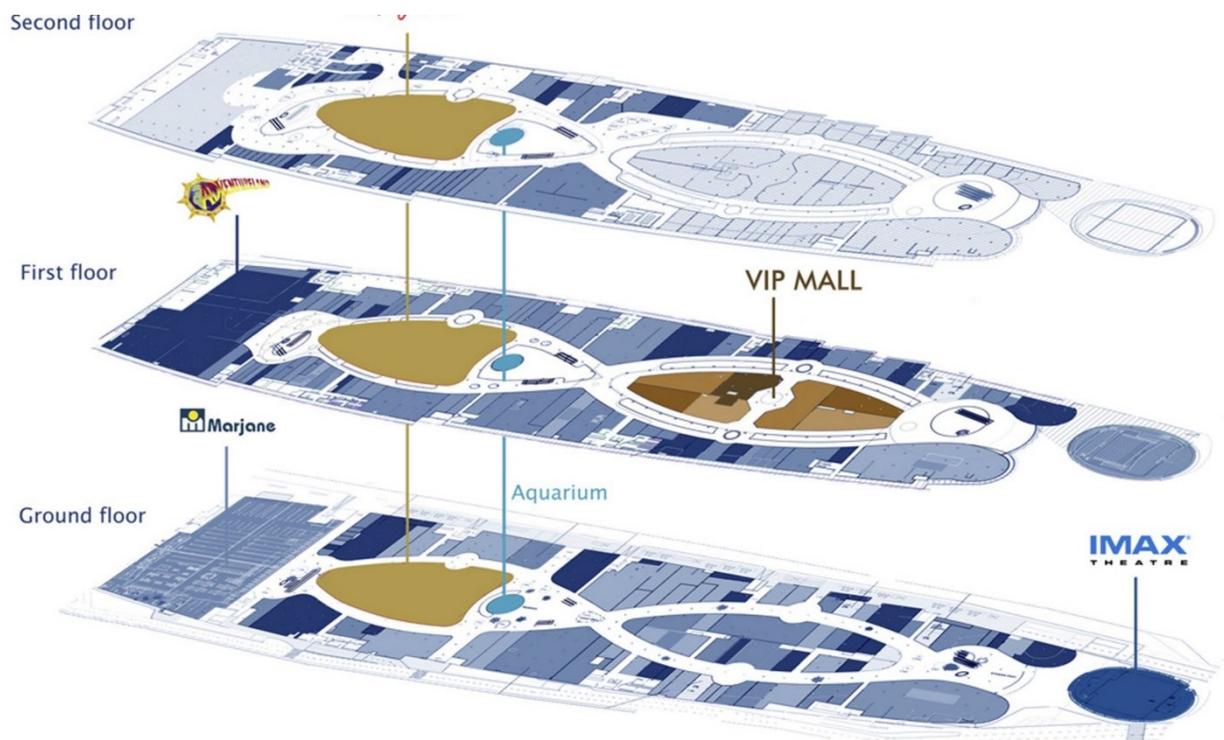


Fig. 1.17. Morocco Mall in Casablanca. Schematic axonometry

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------

602-ABi 11572620 EN

Sheet

31





Fig. 1.19. Carré Eden shopping mall in Marrakesh. Axonometry [19]

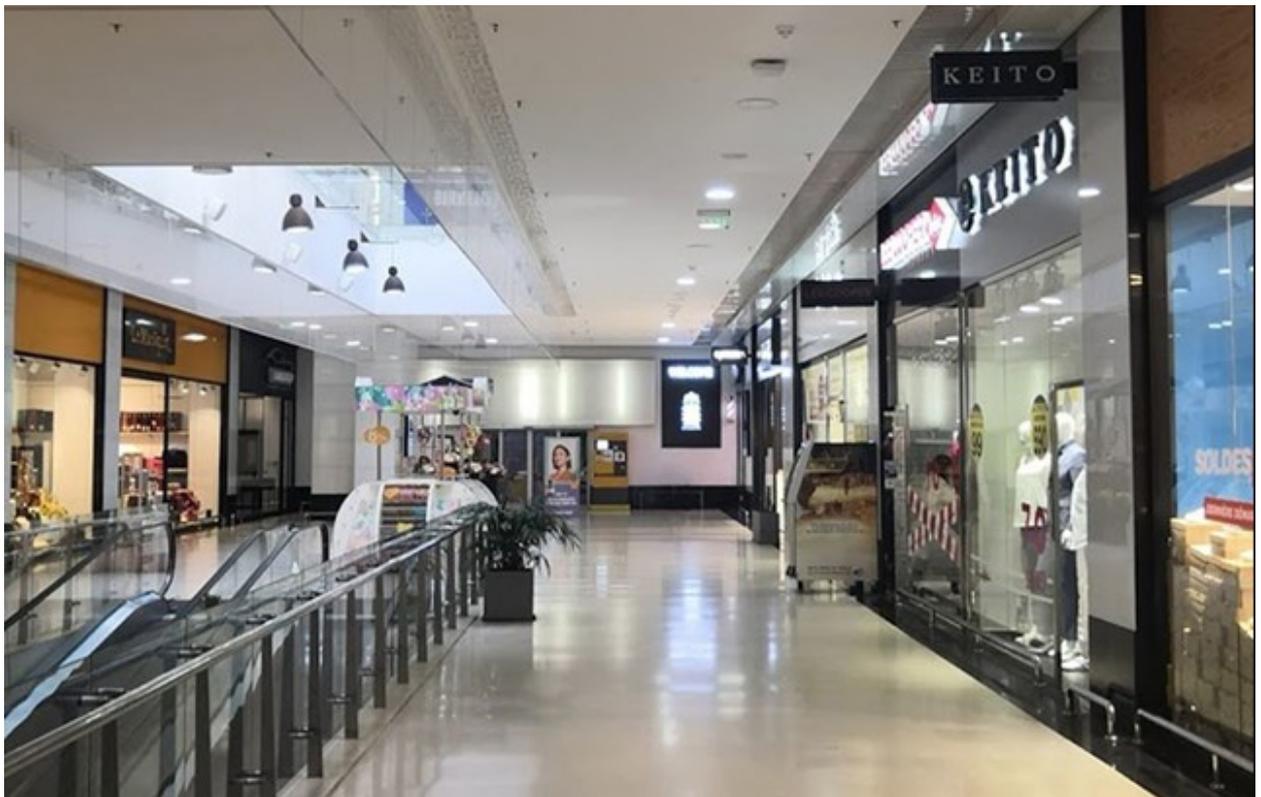


Fig. 1.20. Carré Eden shopping mall in Marrakesh. Interior

Chang	Sheet	Document No.	Signature	Date

602-ABi 11572620 EN

Sheet

33





Fig. 1.22. The Almazar Mall in Marrakesh. Ground floor plan [20]

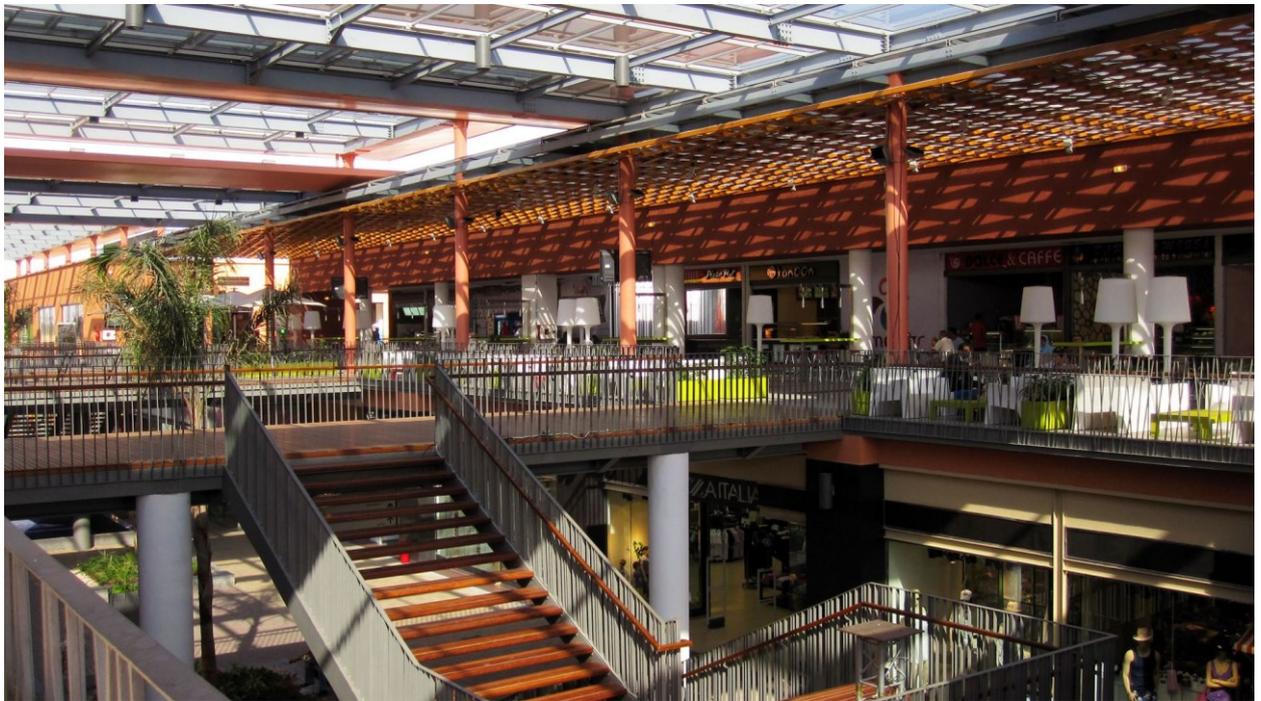


Fig. 1.23. The Almazar Mall in Marrakesh. Interior view of the central passage [20]

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------

602-ABi 11572620 EN

Sheet

35



Atlas Mall Kenitra is one of the newer developments in the city and is known as a hub for socializing and shopping (Fig. 1.26). This mall offers a range of retail stores, entertainment facilities, a food court, and other commercial services.



Fig. 1.26. Atlas Mall Kenitra

Carrefour Market (Kenitra) belongs to Carrefour chaine. Carrefour has a hypermarket in Kenitra – an anchor of a larger shopping complex that includes smaller retail outlets and services with a wide variety of products ranging from food to electronics and clothing. Although by modern standards this establishment cannot be considered a full-scale mall due to the absence of restaurants and entertainment facilities, it functions as a shopping center (Fig. 1.27).



Fig. 1.27. Carrefour Market (Kenitra)





modern technologies makes shopping more enjoyable and efficient, providing convenience, personalized offers and information in real time.

The considerations outlined above have allowed us to form a list of techniques that can be used when designing a new shopping mall in the city of Kenitra, Kingdom of Morocco: futuristic and rooted in the local context.

In line with global trends in shopping mall development, and specifically considering the context of Morocco and Kenitra, the following key architectural principles for the proposed mall design can be outlined:

**1. Retailtainment Design.** The shopping mall should combine the properties of both commercial and recreational space, creating an attractive environment for visitors, offering a variety of stores along with a sufficient selection of food, leisure and entertainment.

**2. Climate-Controlled Compact&Closed Space.** The mall should be a compact, closed building with climate-controlled interior space comfortable for visitors. The site should be used as much as possible for parking, and the interior space of the building should be used as efficiently as possible.

**3. Anchor Tenants and Zoning.** The structure of a shopping mall should include “anchors” that will ensure the flow of visitors past other, smaller tenants (which significantly expand the variety of goods and services offered), increasing their revenue. The main anchors can be a supermarket, a food court, a cinema, and traditional handicraft shops arranged in a style that evokes the traditional souk market.

**4. Efficient Loading and Service Logistics.** Loading and delivery of goods, especially for food establishments and supermarkets, should be organized at ground level. Delivery of goods should not interfere with the functioning of shopping and entertainment establishments.

**5. Dynamic Internal Communication Spaces.** The interior layout of a mall should provide open spaces that enhance navigation and communication within the building. These large, visually striking spaces also contribute to the overall aesthetic appeal of the mall.

										602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date							40

## 2. ARCHITECTURAL AND PROJECT PART

### 2.1. Urban planning solution

Kenitra (Arabic: القنيطرة - "small bridge") is a city in northwestern Morocco, a port on the Sebou River, 12 kilometers from the Atlantic coast and 40 km north of the capital Rabat (Fig.2.1). The city is the administrative centre of the Gharb-Chrarda-Beni Hssen region.

Before the establishment of the French protectorate over Morocco, only a fortress ("kasbah") stood on the site of the modern city. In 1912, Hubert Lyautey, the first French governor-general, founded the city to develop trade between the cities of the country's Atlantic coast and Fez and Meknes, which lie to the east.



Fig. 2.1. Situational scheme of Kenitra in the Kingdom of Morocco

Kenitra draws its name from a culvert built at Fouarat Lake upstream of the kasbah. The port of Kenitra was opened in 1913 and soon became the country's best river port. In 1933, the French gave the city the official name of Port Lyautey.

										Sheet
										41
Chang	Sheet	Document No.	Signature	Date						



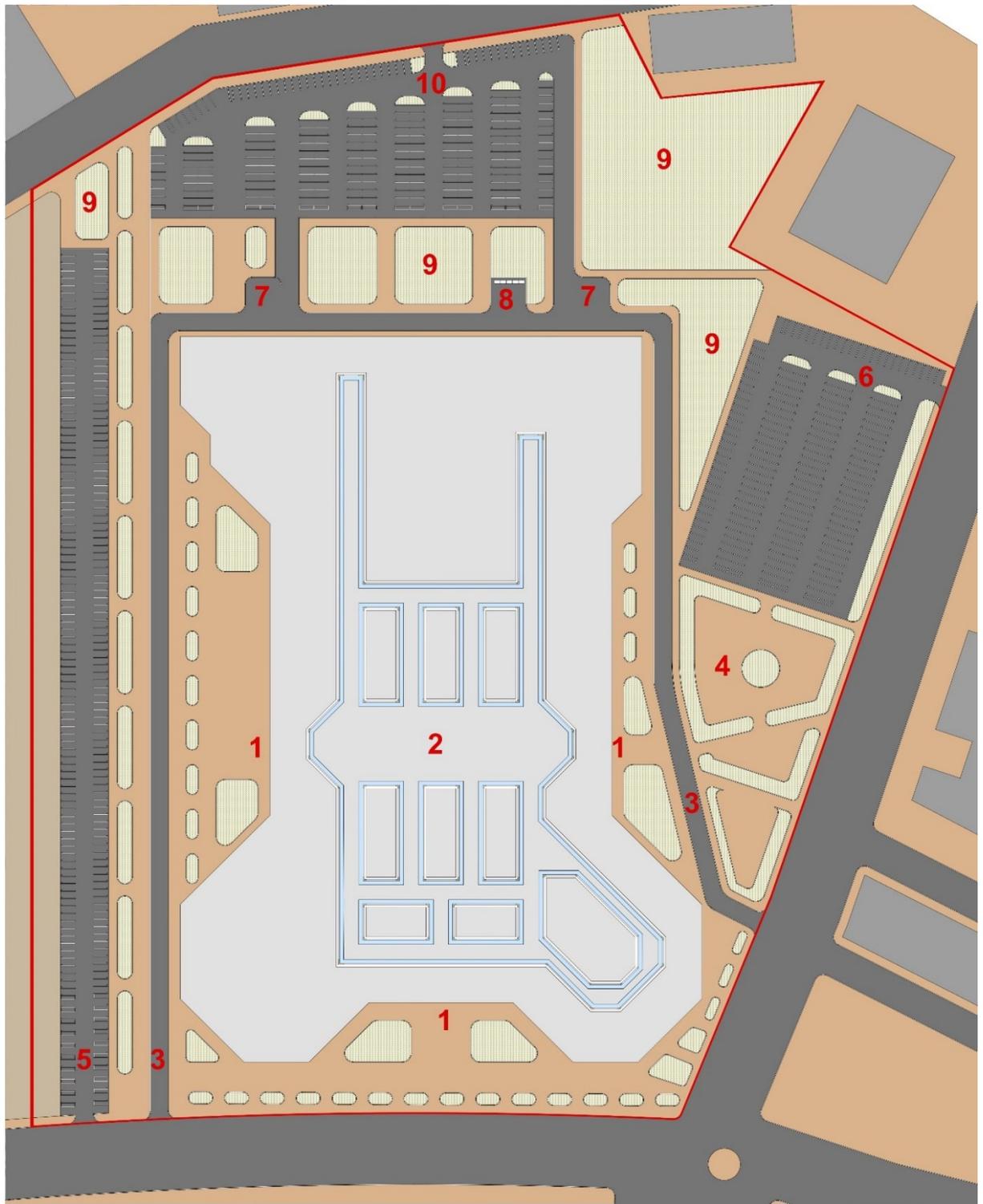
The design area is bounded to the east by Avenue E, and to the south by Route de Rabat – National Route 1. Nearby are large areas of residential development – ordinary and elite, parks and boulevards, a mosque, an administrative zone, and a club zone (Fig. 2.3).

The site has good transport connections, has a high population density in the surrounding areas, has nearby places of mass attendance – a mosque and administrative buildings. All these factors will contribute to a high level of attendance of the designed shopping mall. Access to the site can be arranged from both Avenue E and Route de Rabat, as well as from a residential street located to the north.



Fig. 2.3. Analysis of the functional use of the territories adjacent to the site of the designed shopping mall





**DESIGNATION**

**S=1:1000**

	NAME	AREAS
	PROJECT SITE	92421 m <sup>2</sup>
1	ENTRANCES	-----
2	MALL BUILDING	30412 m <sup>2</sup>
3	EMERGENCY ROUTE	3861 m <sup>2</sup>
4	PARC VISITORS	3821 m <sup>2</sup>
5	PARKING VISITORS 220 Places	4635 m <sup>2</sup>
6	PARKING VISITORS 228 Places	5288 m <sup>2</sup>
7	DOWNLOAD AND UNLOAD	288 m <sup>2</sup>
8	TRASH CANS	144 m <sup>2</sup>
9	GREEN AREAS	11630 m <sup>2</sup>
10	PARKING WORKERS 253 Places	7084 m <sup>2</sup>

Fig. 2.4. Master plan of the shopping mall

The following functional zones are distinguished on the site: building location zone, entrance zone, parking zone, landscaping zone, and utility zone.

At least four entrances have been organized to the shopping mall site (one from Route de Rabat – National Route 1, two from Avenue E, one from a residential street north of the site).

A 6 m wide fire truck driveway is arranged around the shopping mall building, the edge of which is located at a distance of 5 – 8 m from the walls of the building. The radius of the curves is 6 m. In front of the main entrances, reinforced paving is provided, which allows fire trucks to drive onto it.

The area of landscaping is relatively small, about 10% of the area of the site. This is logical, given that the main processes in a closed shopping mall take place inside the building. The most well-maintained areas are in front of the main entrances to the building, as well as along the external pedestrian path connecting these entrances.

A 1.5 m wide paving with hidden waterproofing has been organized around the perimeter of the building. Measures have been taken to ensure the accessibility of the shopping mall area for people with reduced mobility. The paving of concrete flags has seams no wider than 15 mm. At level differences on the site (between pedestrian paths, driveways and parking lots), smooth slopes with slopes that do not exceed regulatory values have been arranged.

In front of the entrances to the building, in front of the above-ground pedestrian crossings for people with visual impairments, it is planned to install warning tactile strips made of yellow concrete tiles measuring 400 x 400 mm with a surface relief in the form of truncated cones. Along the pedestrian path connecting the three main entrances along the perimeter of the building, it is planned to arrange a guide strip made of yellow concrete tiles measuring 400 x 400 mm with a surface relief in the form of longitudinal ridges. All three entrances to the building, intended for visitors, are equipped with tactile information signs for people with visual impairments. Parking lots for people with reduced mobility are marked with special markings on the road surface and signs on vertical posts.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		46

### 2.3. Architectural and planning solution of the shopping mall

The shopping mall building is one-story, elongated, and its shape in plan resembles the so-called "dog bone" due to the fact that additional spaces have been created for visitors from the outside in front of all three main entrances. The overall dimensions of the building in axes are 170.0 x 240.0 m (Fig. 2.5). There is also no basement and technical floor.

The building was chosen as a single-story building to create the best conditions for attracting buyers, the significant size of the existing site, and the lack of need for excessive expansion of the shopping mall area in a city with a population of about half a million people, where 4 other shopping centers already operate, as well as taking into account the high purchasing power of the city.

The absence of vertical communications increases the efficiency of floor space use, creates favourable conditions for the evacuation of visitors in case of danger, and ensures the accessibility of all mall premises for people with reduced mobility.

The national building codes of the Kingdom of Morocco were used in the design of the building [22, 23, 24].

The designed shopping center, according to its main characteristics, can be attributed to the Community Center type according to the ICSC classification [18], however, in terms of configuration it does not belong to strip centers, but to closed malls.

This decision was made taking into account the local climatic features, as well as the fact that the shopping malls already existing in the city are closed and offer their visitors climate-controlled interior space, which provides a favorable internal microclimate throughout the year.

The functional structure of the shopping mall includes two anchors, one of which is a supermarket and the other is a group of restaurants. The pharmacies characteristic of the Community Center are located in the form of several medium-sized establishments, rather than one large one.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		47

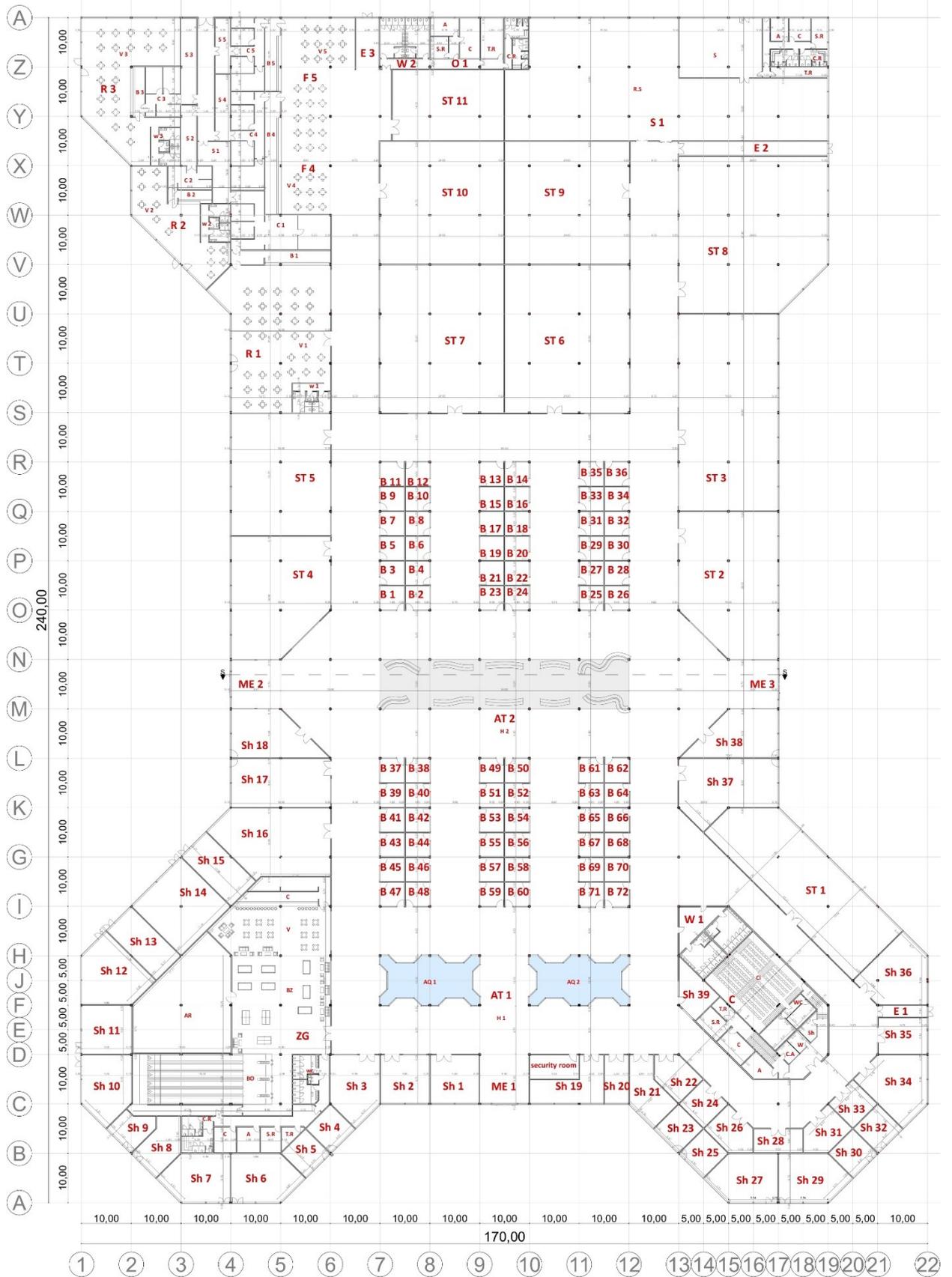


Fig. 2.5. The ground floor plan of the shopping mall

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------

602-ABi 11572620 EN

Sheet

48









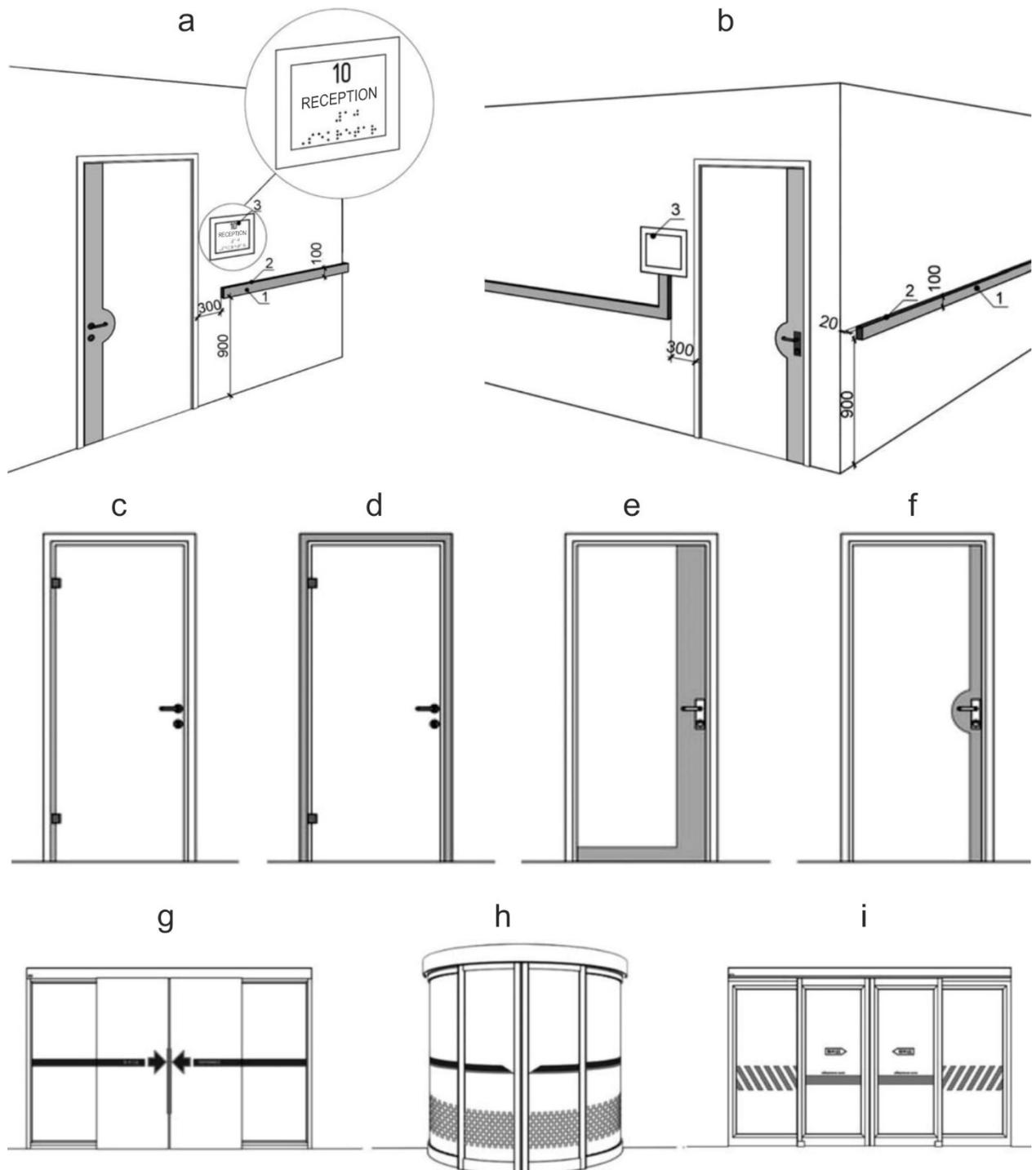


Fig. 2.6. How to use tactile information indicators and contrasting colouring to inform people with visual impairments [26]: a – the placement of the room's tactile informational indicator in the corridor to the right of the door; b – the arrangement the room's tactile informational indicator to the left of the door when it is impossible to place it to the right of the door (1 – tactile information stripe; 2 – tactile information sign; 3 – informational tactile plate duplicating textual information in the tactile form of flat printed text and Braille font); c – f – the door openings' colour marking (c, d – individual elements and details (door handles, hinges); e, f – door panels horizontally and vertically); g – i – transparent doors' colour marking

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------



## 2.5. Engineering equipment of the shopping mall

The shopping mall project involves equipping the facility with a complex of modern engineering systems to ensure its safe and comfortable operation.

A heat pump is provided, which in the spring and autumn period ensures the maintenance of a comfortable temperature in the premises.

Ventilation is mainly mechanically driven. Recuperators are installed, which in the cold season can utilize part of the heat of the air removed from the premises.

Air conditioning is provided from a centralized system that covers the entire building. At the same time, planning and design measures have been taken to ensure through and corner ventilation of the premises and thereby ensure a comfortable temperature regime in the premises during part of the warm period of the year without the use of air conditioning.

Water supply and sewage are centralized, from city networks. It is planned to collect and clean atmospheric precipitation falling on the roof and use it for watering green areas or as technical water. Electric boilers are used to heat water in showers and toilets, and in the kitchens of restaurants and cafes.

The shopping mall is powered by city grids, supplemented by an autonomous power supply from photovoltaic panels located on the roof. The electricity generated by the photovoltaic panels is supplied to the power grid through a specialized metering unit, thus reducing the financial costs of electricity supply.

To install photovoltaic panels on a flat roof at the desired angle of inclination, without violating the integrity of the roof layers, so that the entire structure is resistant to strong winds, special installation systems with ballast in the lower part in the form of concrete blocks are used - so-called Concrete Footing or Foundation Type of installation.

This project uses a type of installation system, such as the AS Solar Tripod Concrete Roof Solar Mounting System (Fig.2.8). This system usually is used for flat roofs with high parapet walls. where the massive concrete bases are placed directly on the roof without any penetration.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		55



### 3. ARCHITECTURAL STRUCTURES

#### 3.1. General description of the building

The one-story shopping mall building is frame-type, with a monolithic reinforced concrete frame with circular concrete-filling tube columns arranged mainly on a 10x10 m grid. The building has a shape in plan similar to the so-called "dog bone", with overall dimensions in axes of 240.00x170.00 m (Fig. 3.1). Given its large size, the building is divided by expansion joints into three structurally independent blocks.

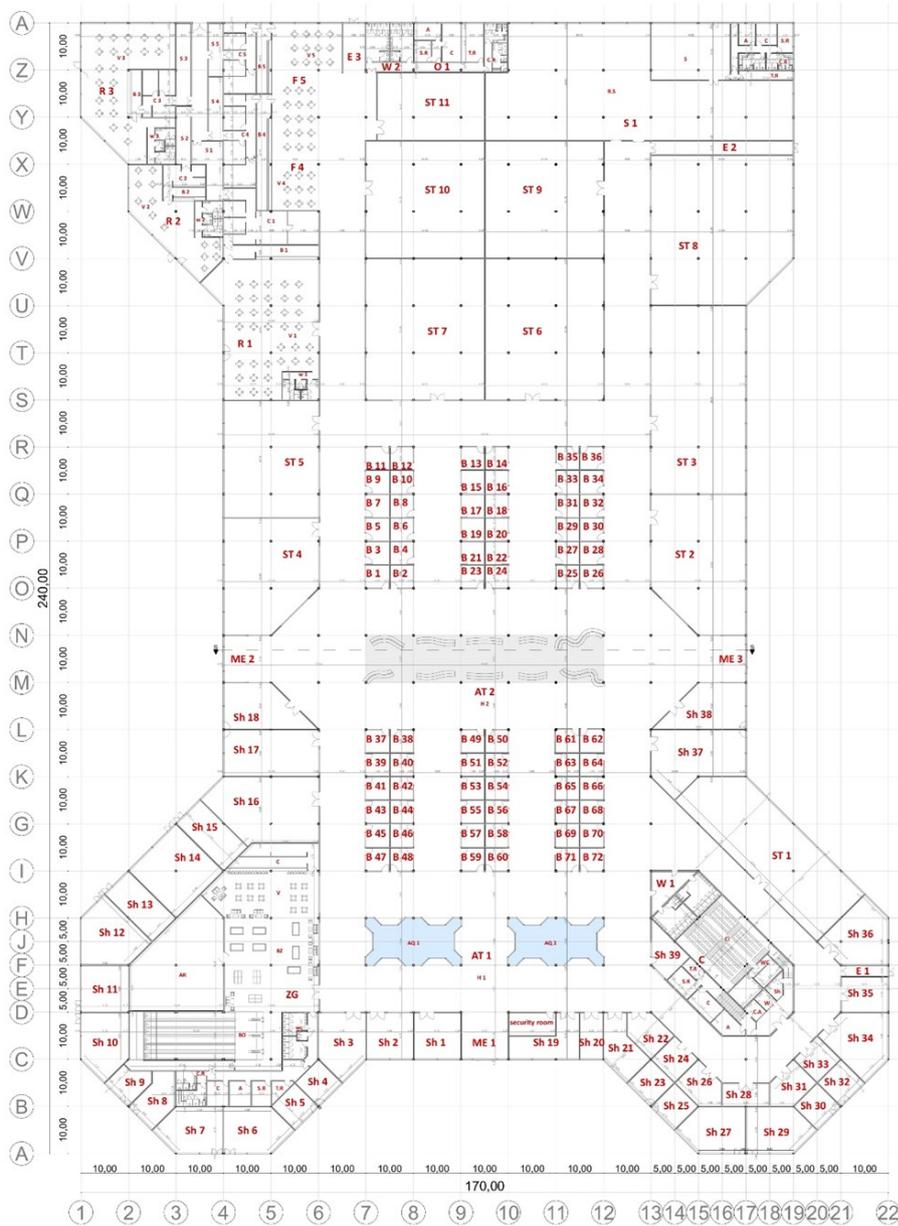


Fig.3.1. Layout of the main structures of the ground floor of the shopping mall

				602-ABi 11572620 EN		Sheet
Chang	Sheet	Document No.	Signature	Date	57	

## 3.2. Main structural elements of the building

### 3.2.1. Foundations

Since the building does not have a basement, it was decided to use a shallow foundation. Given that the building is framed, but has self-supporting external walls, the foundations are designed according to a combined scheme: the middle rows of columns are supported by isolated (column) footings, and strap footings (Fig. 3.2, a) are arranged along the building's perimeter. In this case, a layer of plain concrete (PC) is first placed under the reinforced concrete (RC) foundation (Fig. 3.2, b). Following the recommendation [28] the PC footing should not be increased by over 200 mm, and it was not considered in structural calculations.

The building uses circular concrete-filling tube columns, the steel part of which is manufactured in the factory and attached with nuts to anchors cast from a monolithic reinforced concrete footing.

The reinforcement of the column footing and the detail of the column attachment to the footing are shown in Fig. 3.3. The reinforcement of the strap beam (also referred to as the tie beam) is shown in Fig. 3.4.

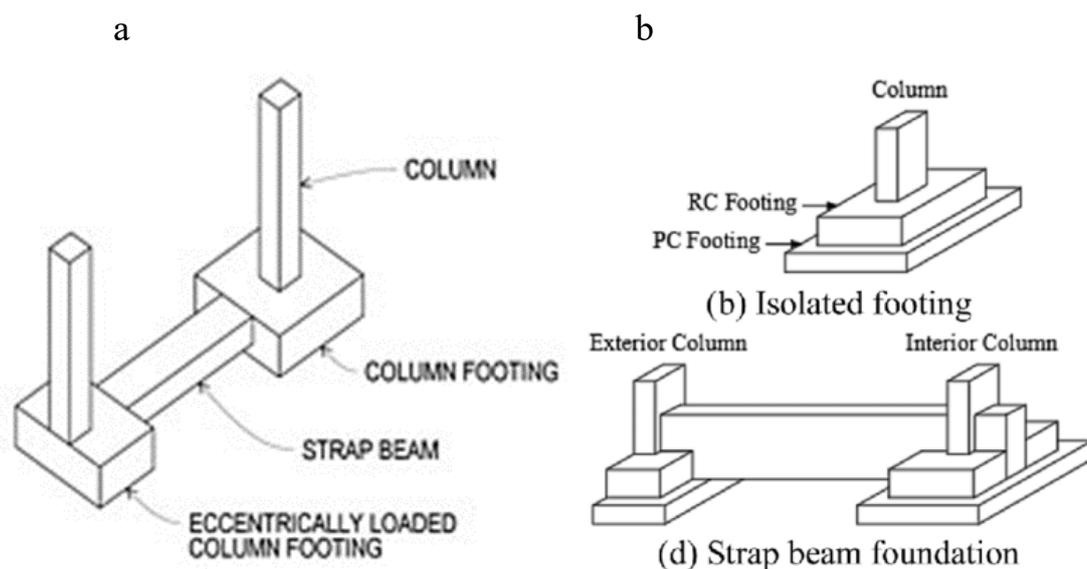


Fig.3.2. Foundations of the building: a – scheme of arrangement strap beam foundation; b – scheme of placing plain concrete (PC) and reinforced concrete (RC)

Chang	Sheet	Document No.	Signature	Date

The internal partitions are supported by a monolithic reinforced slab 200 mm thick, located above the bases of the metal columns and hides the column base stiffeners. Under heavy equipment, such as aquariums, separate foundations are arranged, separated from the monolithic base slab under the floor by expansion joints.

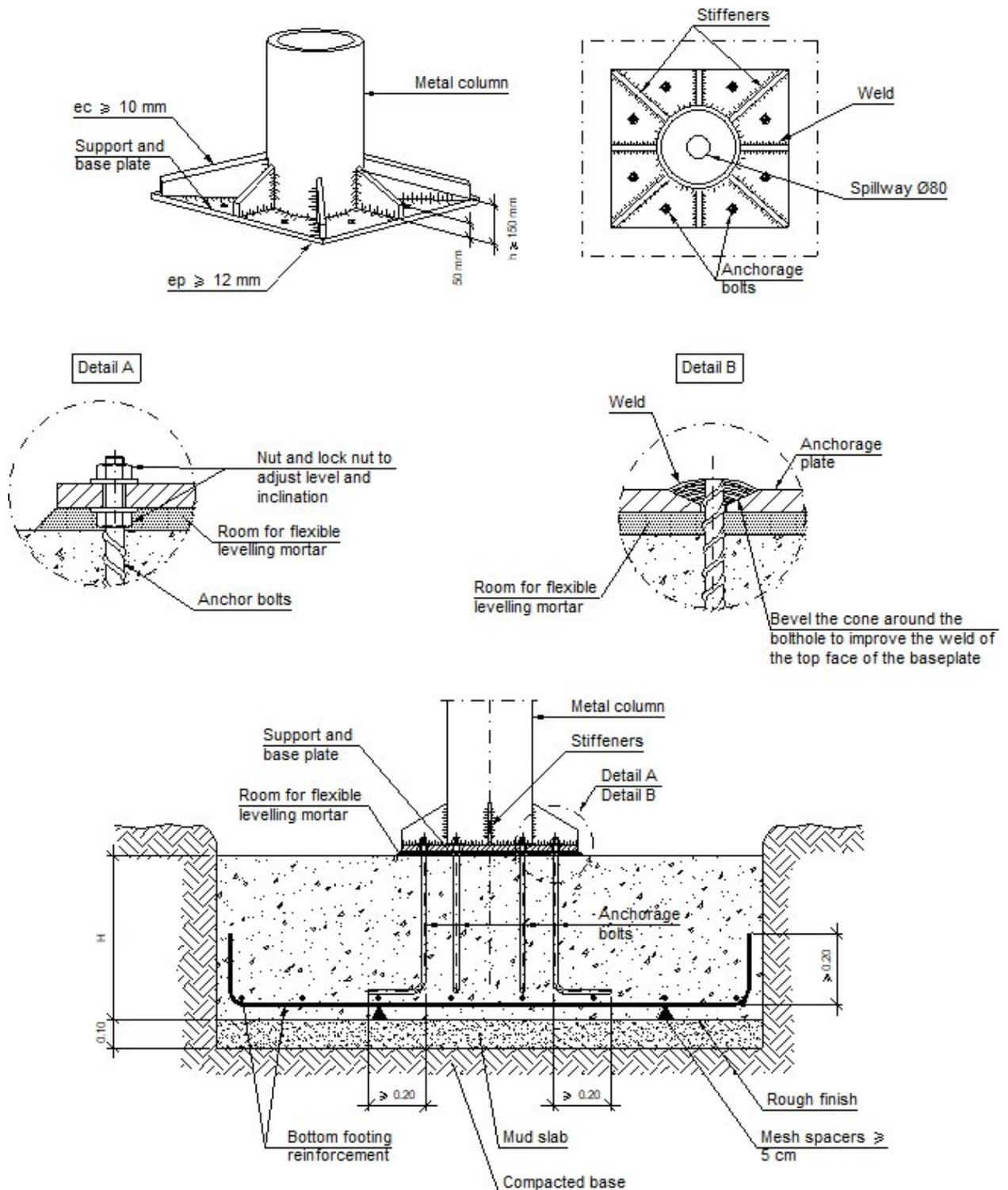


Fig. 3.3. Column base (circular) at foundations. Rigid connection [29]

Chang	Sheet	Document No.	Signature	Date
-------	-------	--------------	-----------	------

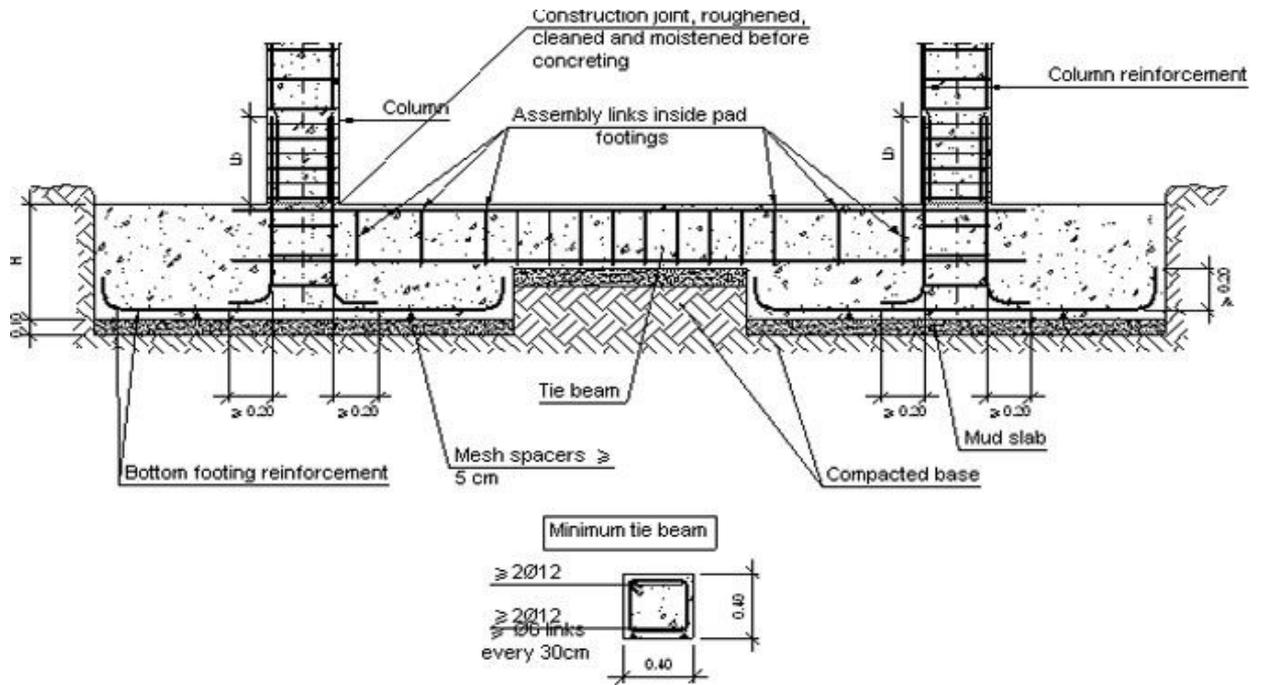


Fig. 3.4. The reinforcement of strap (tie) beam

### 3.3.2. Frame and ceiling

The frame of the building consists of circular concrete-filling tube columns  $\varnothing$  325 mm, arranged on a grid of 10 x 10 meters, and I-beam girders  $h=400$  mm resting on these columns. The circular concrete-filling tube columns combine the advantages of both steel and concrete as structural materials. Such a column is a composite structural element with improved strength, ductility, seismic performance, construction efficiency, cost efficiency, and aesthetics (which is especially important for public building interiors) [30, 31].

The column diameter and pipe wall thickness were determined according to recommendations [32]. These parameters were fundamentally influenced by the loads the column must carry. Although initial sizing was based on the structure's strength requirements, the final selection of column parameters was also influenced by a crucial design parameter such as column slenderness.

For joining girders to columns the prefabricated connection was used following the recommendations [33]. The junction of the girders to the column is shown in Fig. 3.5.

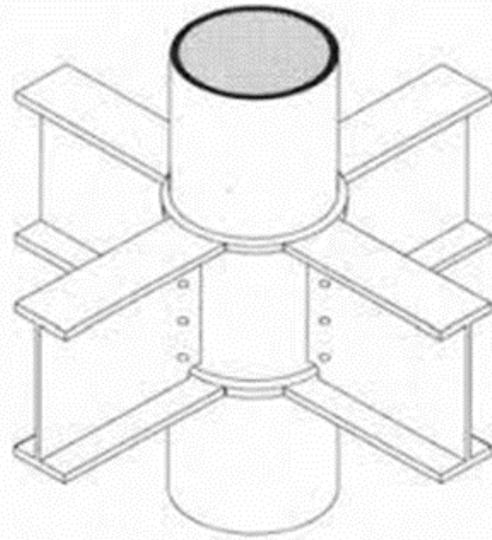


Fig. 3.5. Prefabricated connection for girder and concrete-filled steel tube column

The girders are supported by I-beams 240 mm high, arranged at a pitch of 2 m. A fixed formwork made of metal profiled sheet is placed on the beams, on which a monolithic reinforced concrete floor slab is arranged (Fig. 3.6).

To ensure geometric stability and rigidity of the frame, portal braces, and cross braces are arranged between the columns in certain places. Cross braces are connected to the columns according to the pattern shown in Fig. 3.7.

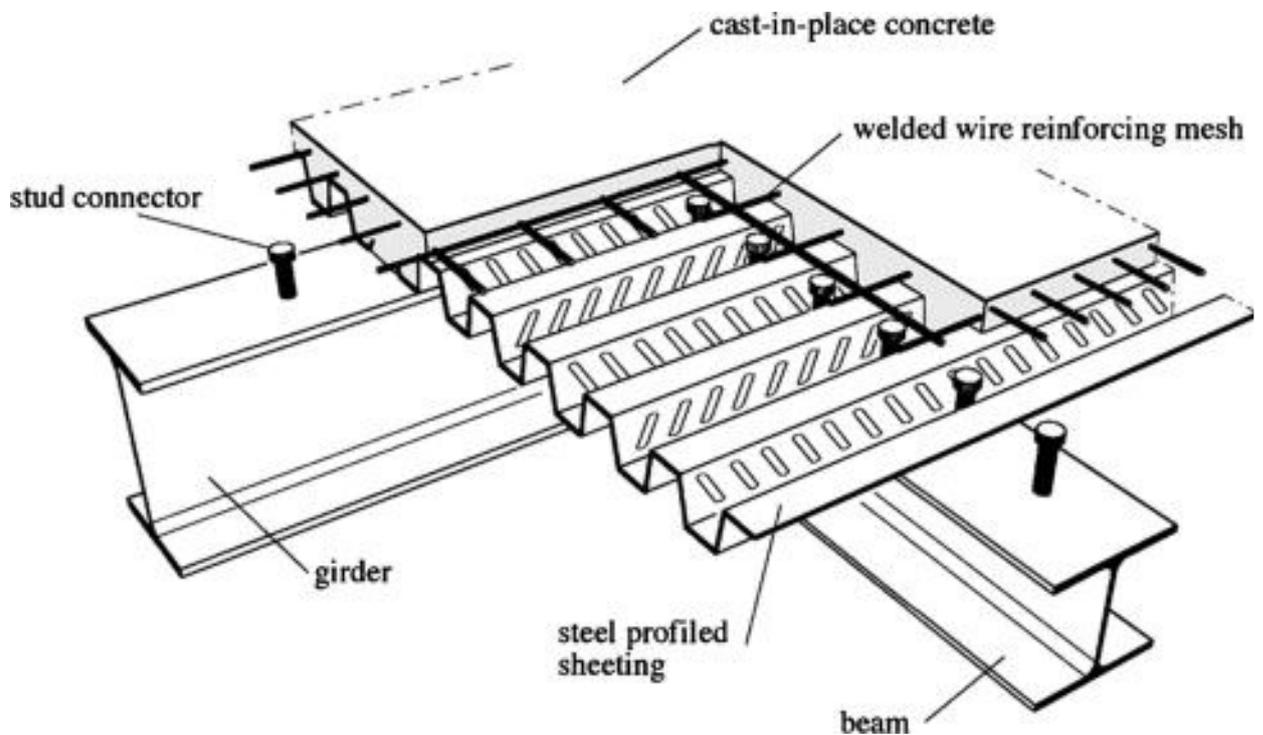


Fig.3.6. Detail of a monolithic reinforced concrete slab on steel beams

Chang	Sheet	Document No.	Signature	Date



(AAC) with a thickness of 200 and 150 mm, respectively. The partitions enclosing the shower rooms and other wet-mode rooms are of reinforced brickwork with a thickness of 120 mm. The partitions between small retail establishments in the "bazaar" are made of sandwich panels.

Specific masonry techniques for AAC blocks of various thicknesses are shown in Fig. 3.8.

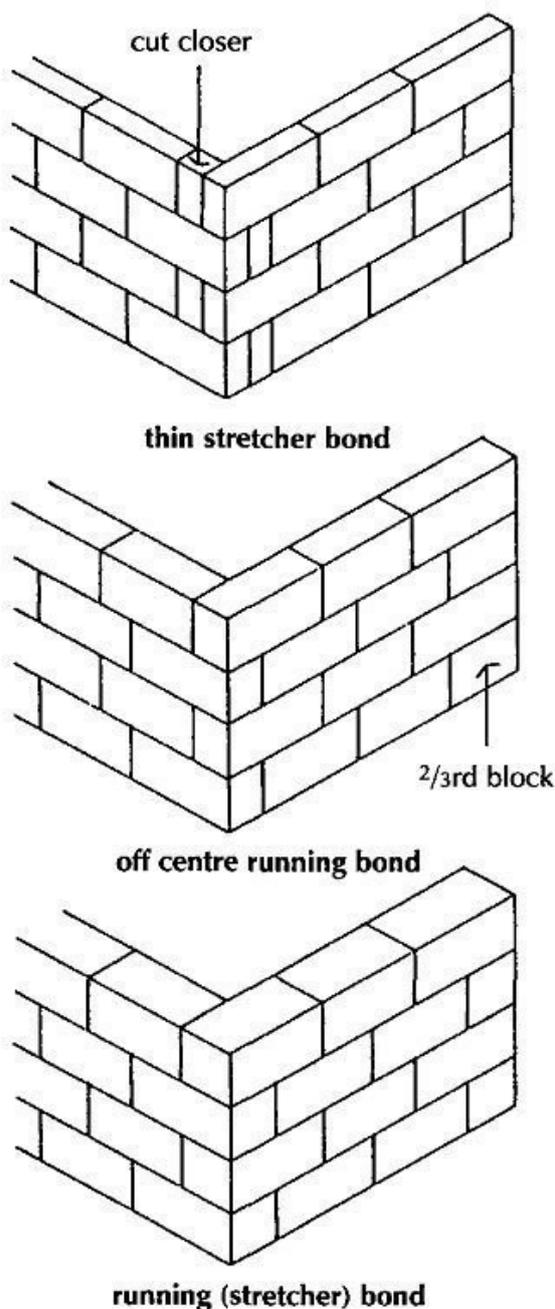


Fig. 3.8. Masonry techniques of walls and partitions of AAC blocks (from top to bottom): an inter-room partition with a thickness of 150 mm; an inter-shop partition with a thickness of 200 mm; external self-bearing wall with a thickness of 300 mm

Chang	Sheet	Document No.	Signature	Date

Low weight, high level of fire resistance, sufficient strength and durability, good vapor permeability, ease of masonry and high quality of the wall surface determine the choice of AAC as the main material for the construction of walls and partitions of a shopping mall. In the Kingdom of Morocco, AAC blocks are available in a wide range. The length of the blocks is 600 mm, the height is 200 mm, and the width varies from 75 to 300 mm (Fig. 3.9).

AAC BLOCK SIZE ( 600 x 200 x 75 - 300 ) mm		
 <b>3" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 75 mm</b>	 <b>4" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 100 mm</b>	 <b>5" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 125 mm</b>
 <b>6" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 150 mm</b>	 <b>7" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 175 mm</b>	 <b>8" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 200 mm</b>
 <b>9" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 225 mm</b>	 <b>10" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 250 mm</b>	 <b>12" AAC Block</b> ( L x H x B ) Nominal size <b>600 x 200 x 300 mm</b>

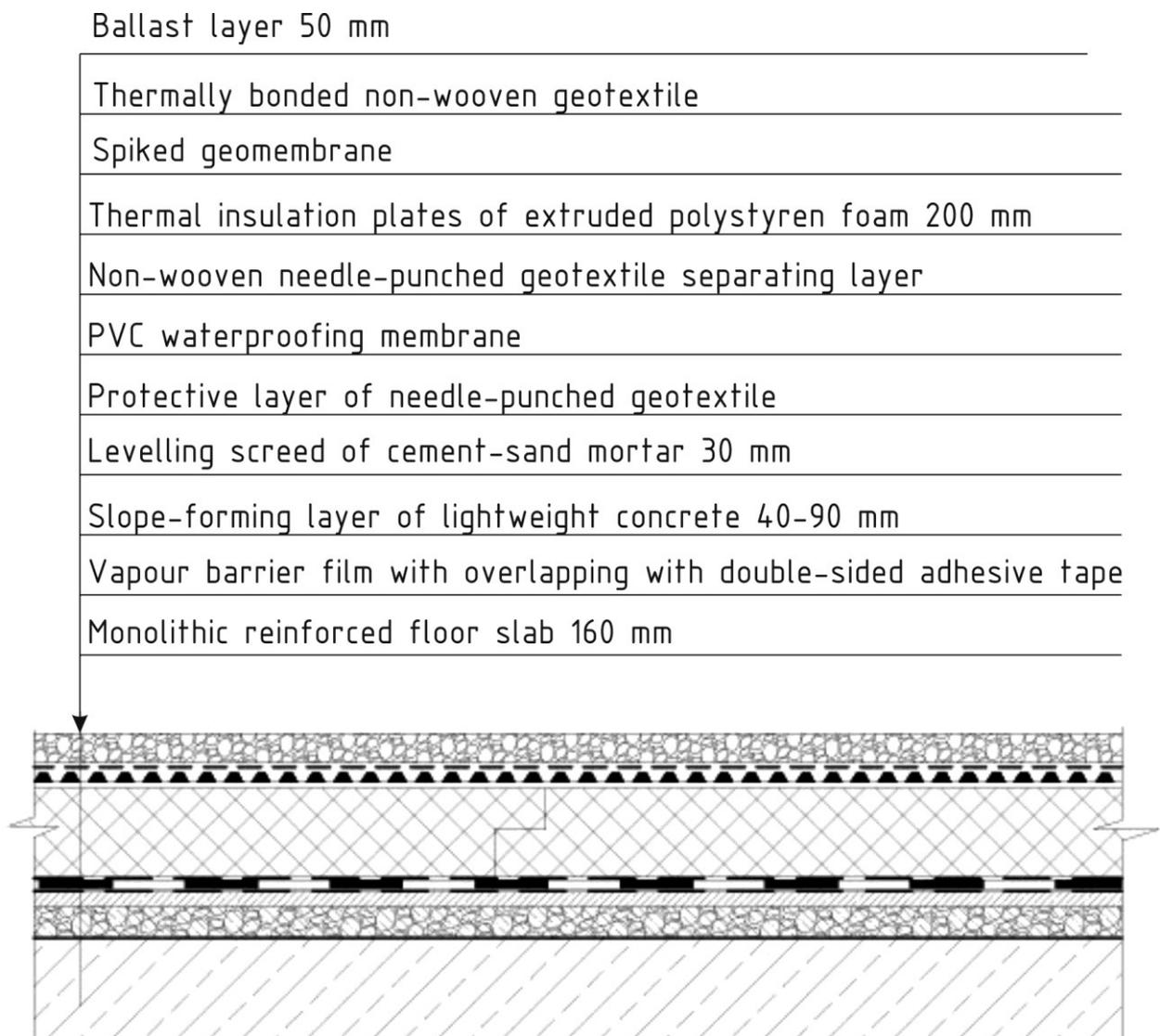
Fig. 3.9. Nomenclature of AAC blocks common in Morocco

### 3.3.4. Roof

Given the absence of a technical floor in the building, to reduce overheating of the roof structures by solar radiation in the warm season, the so-called inversion roof was used, the peculiarity of which is the location of the waterproofing layer under the thermal insulation layer (Fig.3.10).

This requires the use of a material with a low absorption rate as a heat insulator, for example, extruded polystyrene foam or foam glass.

Light-coloured gravel was used as the top layer, poured in a layer of 50 mm. The top layer heats up during the day but does not have time to transfer heat to the coating structure through the thermal insulation layer. At night, this layer cools down. Thus, the heating of the supporting structure of the coating – a monolithic reinforced concrete slab – is significantly slowed down compared to using a traditional flat roof structure. The ballast layer of gravel also protects the thermal insulation and waterproofing layers of the roof made of polymeric materials from destruction due to irradiation with the ultraviolet part of the solar radiation spectrum and from mechanical damage, which can increase the roof's durability.



Fig, 3.10. Schematic section of the inversion roof

### 3.3.5. Windows and glazed curtain wall

Taking into account the small importance of providing thermal insulation and the significant requirements for стійкість до ультрафіолетової частини спектру сонячного опромінення, вікна виконані з алюмінієвого профілю (Fig. 3.11)..

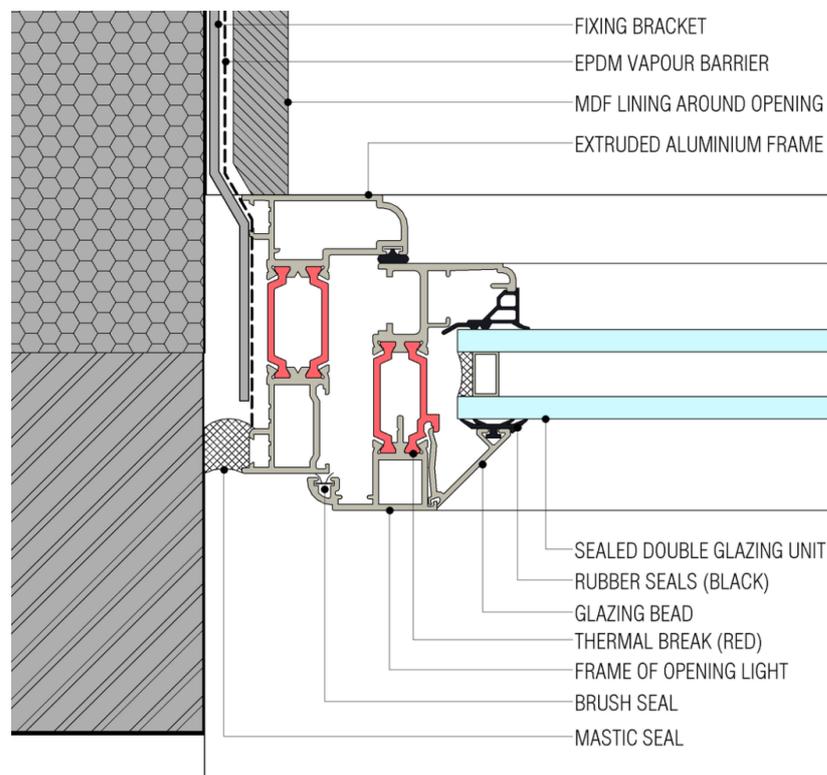


Fig.3.11. Detail of a window made of aluminum profile

External shop windows, sections of the facade near the entrances, and bay windows in restaurants are made of the ALT F50 aluminum facade post-and-beam system by ALUTECH [34] (Fig. 3.12). The main characteristics of the facade system used:

- visible profile width – 50 mm;
- depth 270 mm;
- thickness of the double-glazed window filling – 62 mm;
- heat transfer coefficient up to  $1.8 \text{ W/m}^2 \cdot \text{K}$ ;
- integration with any ALT window and door systems.

The detail of the fit of the window sash to the frame is shown in Fig. 3.13.



Fig. 3.12. Curtain wall made of aluminum profiles



Fig. 3.13. Opening the sash in the curtain wall

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		67

### 3.3.6. Doors

The exterior doors at all three main entrances are aluminum, ALT W62 by ALUTECH [35] (Fig. 3.14), integrated into the used aluminum facade system ALT F50. Main characteristics of the doors:

- profile thickness 62 mm, with a thermal break;
- filling – double-glazed window;
- heat transfer resistance – 0.61 W/(m\*K), class B
- sound insulation – up to 33 dB.

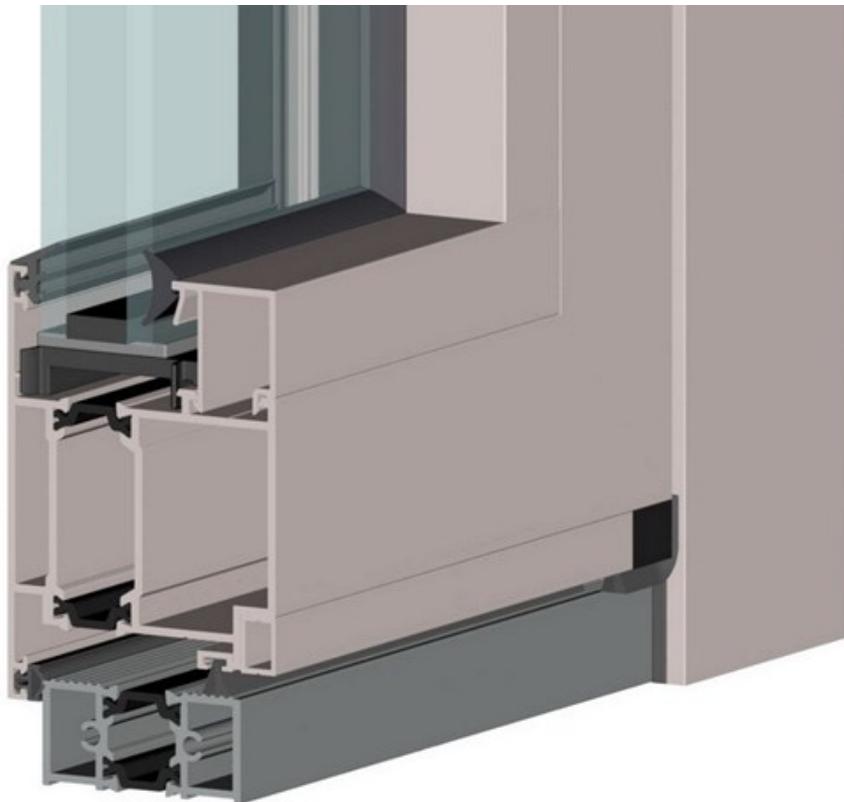


Fig. 3.14. The detail of the exterior door ALT W62 by ALUTECH

Interior doors are ALT C43 by ALUTECH [35] with single glass filling (transparent or frosted) (Fig.3.15). Main characteristics of the doors:

- Acoustic insulation (depending on the infill unit used) up to 33 dB;
- Internally visible profile width – 48-145 mm;
- Externally visible profile width – 4-26 mm.

										Sheet
										68
Chang	Sheet	Document No.	Signature	Date						



Fig. 3.15. The detail of the interior door ALT C43 by ALUTECH

Both external and internal aluminum doors have bracket-type handles, easy to use for people with disabilities, equipped with the necessary devices for automatic closing, sealing, etc.

### 3.3.7. Floors

The floors are made of porcelain tiles, which are traditional for Morocco. The floor of the atriums is decorated with an ornament in the Moroccan national spirit. Floors in commercial establishments are monotonous in light shades. To prevent slipping the tiles are unpolished Tactile accessibility elements made of yellow polyvinyl chloride tiles up to 3 mm thick with a relief surface height in the form of truncated cones up to 5 mm. glued to the tile floor.

#### 4. ENGINEERING IMPROVEMENTS AND TRANSPORT

The design site is located near the central part of the city in a well-developed and landscaped area. In general, the task of vertical planning and drainage has been solved. The territory does not require additional engineering protection measures, the construction of retaining walls, and drainage trays, is currently free from development. It is currently occupied by a parking lot.

That is, after the completion of the construction of the facility, the site will require minor vertical planning measures to organize drainage from its territory. The vertical planning of the site is carried out according to the so-called urban principle, when atmospheric precipitation is drained from the surface of lawns and sidewalks to driveways located below them in level, from driveways to the carriageways of streets and roads, and then into the city storm sewer system.

The site includes a 6 m wide driveway around the building, an unloading area and open parking lots for visitors with 220 and 228 spaces, each of which has at least 6 spaces for disabled cars, and a staff parking lot with 2 spaces for disabled cars. The radius of curvature at the junction of the driveways with the roadways of Route de Rabat and Avenue E, and for turns on the site is 6 m.

The mall building is surrounded by a concrete paving slab for the gathering and movement of visitors, which allows fire engines to enter to extinguish fires.

The road surface of the driveways, parking lot and unloading area in the economic zone is made of asphalt-concrete (Fig. 4.1). The level of the driveways is located 15 cm below the adjacent sidewalks and lawns. The perimeter of the driveways is framed by concrete curbstones (Fig. 4.2).

The perimeter paving is made of concrete paving flagstones with hidden waterproofing in a strip 1.5 m wide (Fig. 4.3), the sidewalks and pedestrian paths and platforms are made of concrete paving flagstones (Fig. 4.4). The sidewalks and paths are framed with curbstones along the perimeter.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		70

In front of the entrances to the shopping mall, warning tactile strips made of concrete flagstones measuring 400x400 mm with a surface of regularly spaced truncated cones are arranged (Fig. 4.5).

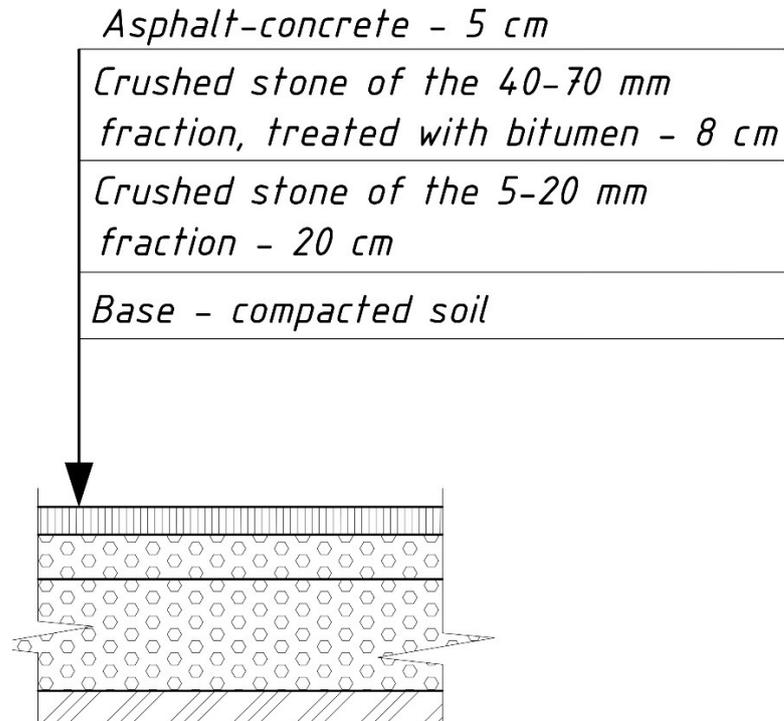


Fig. 4.1. Design of road surface of driveways, unloading area and parking lot

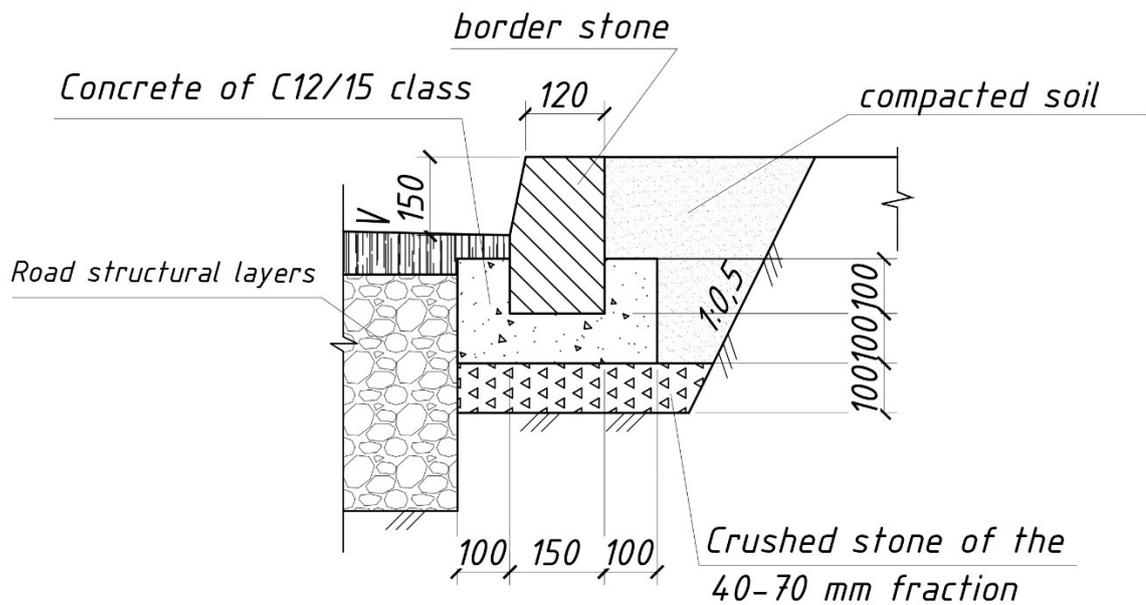


Fig. 4.2. Construction of curb stone installation

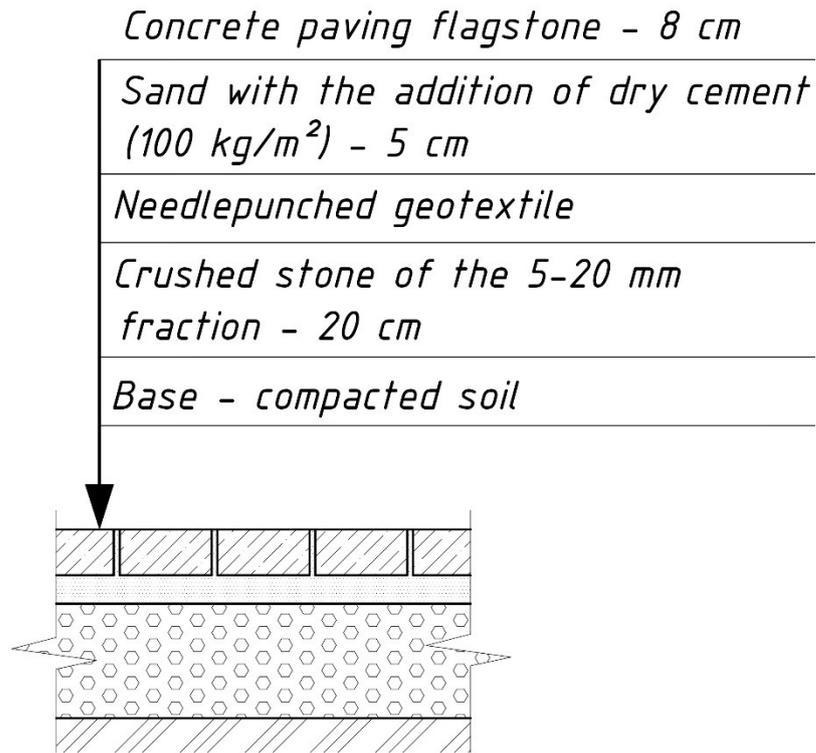


Fig. 4.3. The structure of the covering of pedestrian spaces, which allows fire engines to drive in

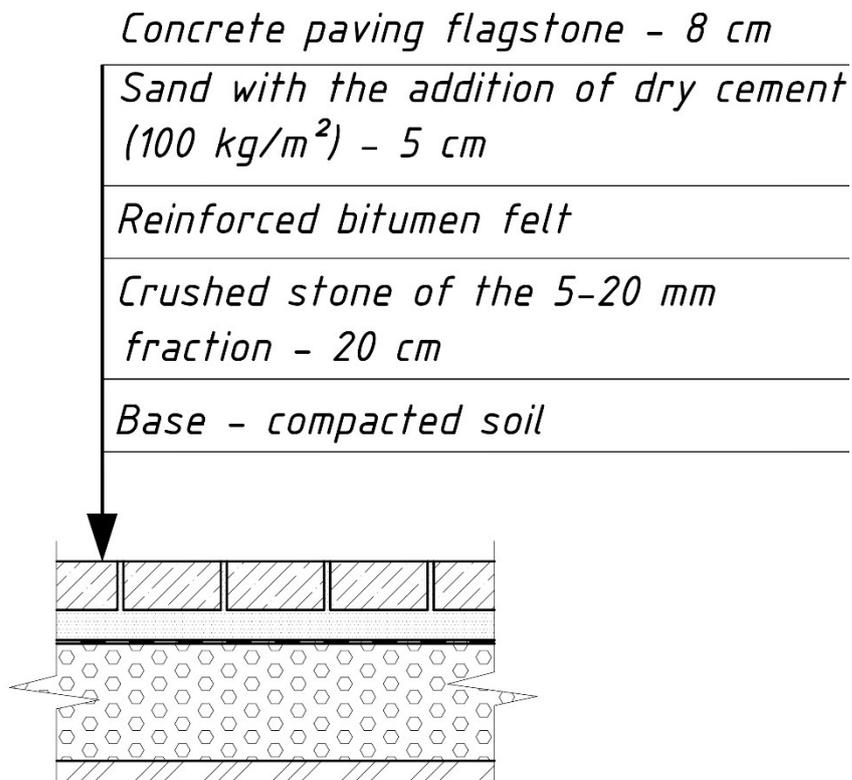


Fig. 4.4. Covering design with hidden waterproofing around the perimeter of a shopping mall building

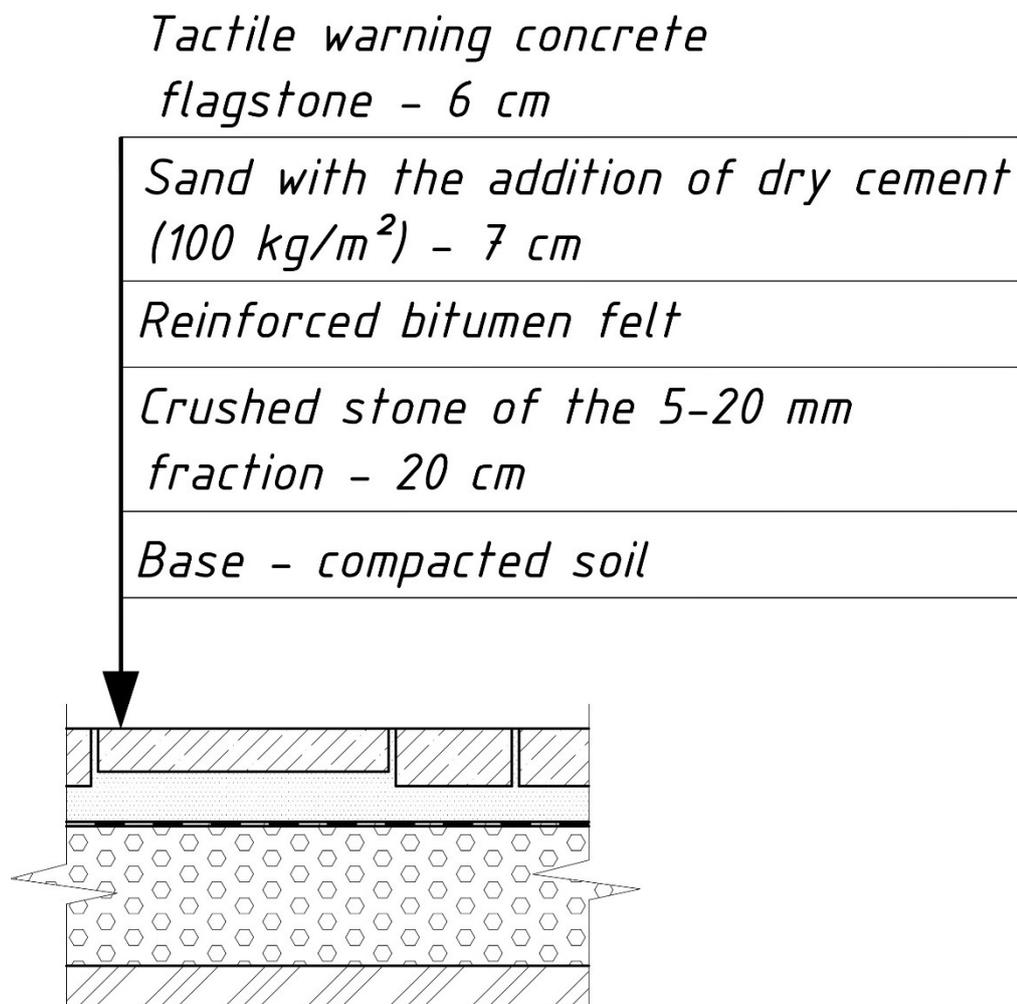


Fig. 4.5. Paving construction with built-in tactile warning flagstones

The calculation of the total number of parking spaces in two parking lots for visitors (220+228=448 spaces) was carried out based on the calculation of 5 – 8 parking spaces for every 100 m<sup>2</sup> of retail space, while not taking into account the area of atriums, corridors, and non-retail premises.

The determination of the number of parking spaces for cars of people with disabilities (6 in each of the parking lots for visitors) was carried out based on the calculation of 5 – 7 spaces for every 200 parking spaces in the parking lot.

The calculation of the number of parking spaces for personnel was carried out based on the total number of employees, which was determined following the number and size of trade and service enterprises provided for by the project as part of the shopping mall.

## 5. INTERIOR

### 5.1. The main idea of organizing the interior space of the shopping mall

The main idea of organizing the interior of a shopping mall is to create an attractive, interesting, and convenient environment for a long stay, shopping, and receiving services, which would stimulate visitors to stay inside the shopping mall for as long as possible while visiting as many trade and service establishments as possible located in the shopping mall. This goal is achieved by creating convenience for tenants and visitors, flexible in-use retail spaces, and creating attractive public spaces.

The internal public spaces – atriums, passages, food courts – through spatial planning and design should create opportunities for various options for moving around the mall, social interaction, and holding various events. Both atriums should satisfy the need for both active and passive recreation. Internal landscaping should improve the microclimate and promote psychological relaxation of visitors and employees of the shopping mall.

### 5.2. Interior elements

#### 5.2.1. Floor

The floor is made of ceramic tiles. This meets both the functional requirements of the shopping mall and the national traditions of Morocco and climatic conditions, where it gives a feeling of coolness during the hot season.

The floor throughout the shopping mall forms a monochromatic, light-colored surface, which provides maximum opportunities for flexible use of the interior space. It should be borne in mind that visitors do not tend to focus on the floor when moving between stores and making purchases.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		74

At the same time, public spaces such as atriums, where visitors rest, and make appointments, that is, are in a calm state and can consider the surroundings, including the floor. Therefore, in both atriums, the floor is decorated with an ornament made in the Moroccan national style. This not only decorates the public space but also gives the interior of the mall a national flavour.

### **5.2.2. Walls and partitions**

The walls in the interior of a shopping mall have no independent meaning – they are only a neutral background for displaying goods. A significant number of internal partitions are glazed display cases with goods displayed, or through them, you can observe visitors.

Wall decoration in catering establishments is a combination of a basic neutral background and elements of subject content, individual for each establishment.

### **5.2.3. Ceiling**

The ceiling in large-area rooms and public spaces is designed as a suspended lattice ceiling, through which the surface of the covering, girders, and beams, painted in a narrow color, is visible. This solution makes it possible not to reduce the internal volume, which is important for maintaining a favorable microclimate and also provides space for laying engineering communications.

## **5.3. Colour solution**

The overall color scheme of a shopping mall can be characterized as a neutral base, on which multi-coloured accents can be applied in various combinations, depending on the composition and functional features of the retail establishments that are part of the shopping mall at a certain moment.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		75

## 5.4. Lighting

The project provides for the installation of soft diffused lighting, which creates favorable conditions for shopping, entertainment and recreation. Natural lighting through the windows can be regulated by vertical blinds. Artificial lighting is provided by LED lamps mounted in the suspended ceiling. If necessary, additional local lighting can be organized.

The choice of LED lamps is justified by their advantages over other types of lamps presented on the modern market. They are characterized by low energy consumption, are resistant to frequent switching on and off, are durable, provide high quality lighting without the flickering inherent in gas-discharge lamps, are environmentally friendly, do not contain mercury vapor or other materials inherent in gas-discharge and halogen lamps, are characterized by high mechanical resistance and are easily integrated into automatic lighting control systems, the use of which allows to significantly reduce electricity consumption.

It should also be noted that LED lamps generate a luminous flux that is close in its visible spectrum to natural sunlight, which ensures the perception of colors without distortion.

## 5.5. Furniture and equipment

Stationary furniture and equipment in the interior space can be considered only two giant aquariums, designed in high-tech style, as well as benches and seats in the second mall, designed in the national Moroccan style.

Other equipment and furniture varies depending on the function and style concept of a particular trade or service establishment. Small retail establishments located in the space of the so-called "internal bazaar" are decorated from the outside in the Moroccan national style, creating an imitation of a traditional Moroccan bazaar with various points of sale.

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		76



7. Matuke S. The rise and fall of the American pedestrian mall / Matuke S., Schmidt S., Li W. // Journal of Urbanism: International Research on Placemaking and Urban Sustainability. – 2021. – Volume 14, Issue 2. – P. 129–144.
8. Rubenstein H.M. Pedestrian Malls, Streetscapes, and Urban Spaces / Harvey M. Rubenstein. – New York: John Wiley & Sons, 1992. – 288 p.
9. Cohen L. Buying into Downtown Revival: The Centrality of Retail to Postwar Urban Renewal in American Cities / Lizabeth Cohen // The Annals of the American Academy of Political and Social Science. – 2007. – Vol. 611(1). – P. 82–95.
10. Brambilla R. For Pedestrians Only: Planning, Design, and Management of Traffic-free Zones / Roberto Brambilla, Gianni Longo. – New York: Whitney Library of Design, 1977. – 208 p.
11. Jacobs J, The Death and Life of Great American Cities / Jane Jacobs. – New York, Vintage Books, 1961. – 458 p.
12. Whyte W.H. City: Rediscovering the Center / William H. Whyte. – Philadelphia: University of Pennsylvania Press, Incorporated, 2009. – 388 p.
13. Hardwick M.J. Mall Maker: Victor Gruen, Architect of an American Dream / M. Jeffrey Hardwick. – Philadelphia: University of Pennsylvania Press, Incorporated, 2004. – 276 p.
14. Guy C.M. The retail development process: location, property and planning [Electronic source] / Guy C.M. // International Council of Shopping Centers. – Access mode: <http://www.icsc.org/srch/about/impactofshoppingcenters/briefhistory.html>
15. Walker A. K. Malls no more, centers looking to sell lifestyle [Electronic source] / Andrea K. Walker // The Baltimore Sun, 13 September 2007. – Access mode: <https://www.baltimoresun.com/news/bs-xpm-2007-09-13-0709130019-story.html>
16. Foley S. Online Sales Threat to American Malls [Electronic source] / Stephen Foley, Barney Jopson // Financial Times. 4 February 2013. Archived from the





31. Chacón R. Circular Concrete-Filled Tubular Columns: State of the Art Oriented to the Vulnerability Assessment / Chacón, Rolando // The Open Civil Engineering Journal. – 2015. – Vol. 9. – P. 249–259.
32. Guide to Steel Column Sizes: Dimensions for Your Projects [Electronic source] // Certified Material Testing Products, June 16, 2024. – Access mode: <https://blog.certifiedmtp.com/guide-to-steel-column-sizes-dimensions-for-your-projects/>
33. Prefabricated connection for steel beam and concrete-filled steel tube column / Chenting Ding, Xuebei Pan, Yu Bai, Gang Shi // Journal of Constructional Steel Research. – 2019. – Volume 162. – 105751.
34. Facades [Electronic source] // Alutech Group. – Access mode: <https://alutech-group.com/eu-en/fabricator/facades/>
35. Doors [Electronic source] // Alutech Group. – Access mode: <https://alutech-group.com/eu-en/fabricator/doors/>

					602-ABi 11572620 EN	Sheet
Chang	Sheet	Document No.	Signature	Date		81