The Impact of Building Regulations and Laws on the Form of Cities in Egypt

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Abstracts: Urban formation is a complex interplay of physical infrastructure and socio-cultural dynamics that shape the development and visual identity of cities. Influenced by geographical landscapes, societal structures, and historical contexts, urban planning integrates various architectural elements and legislative frameworks. This study explores the evolution of urban development from ancient civilizations to modern times, emphasizing the role of building regulations in promoting sustainable practices and preserving cultural identities. It examines Egypt as a case study, tracing the historical progression of its urban and building laws, highlighting shifts in policy and their impacts on urban morphology. The analysis underscores the importance of adaptive regulatory frameworks in responding to contemporary challenges such as rapid urbanization and societal changes, thereby shaping the future trajectory of urban environments.

Keywords: Building Laws, Building Regulations , Form Of City , Urban Areas , Building Laws In Egypt.

1. Introduction

Urban planning and development are governed by regulations and legislations that control urban growth and organize urban movement to achieve the creation of well-structured urban environments with coherent architectural and urban patterns. These regulations aim to meet the needs of individuals and the community, ensuring the distribution of the population according to studied densities and the provision of services and infrastructure accordingly. Additionally, they regulate building activities, ensuring the rights of neighbors and the safety and security of individuals and the community.

This research aims to shed light on the development of laws in modern Egypt and to study their impact on city formation. It seeks to identify the key aspects that influence the creation of a distinctive urban form by studying and analyzing the laws related to urban formation.

2. Research Methodology

The research follows the inductive method by studying the governing laws and regulations of construction in Egypt and identifying and defining the elements of city formation. Subsequently, it employs the comparative analytical method to compare the laws and determine the similarities and differences in the elements influencing city formation (building heights, distances between adjacent and opposite buildings, external projections, dimensions and proportions of openings, residential courtyards.

3. Urban Formation

Urban formation can be defined as all the physical elements included in the urban environment that collectively shape the form of the city's development and its visual image, such as buildings, streets, roads, and elements of general site coordination. The formation of the city is influenced by its geographical nature as well as social and cultural aspects.

The elements that influence the shape and planning of a city

Elements of architectural and urban design that affect the shape and formation of urban planning in a city include:

Natural Terrain: Urban planning is influenced by the natural terrain of the area, such as mountains, rivers, and lakes, with infrastructure and buildings adapted in response to these terrains.

Climate and Environment: Climate and environment play a significant role in shaping urban planning, influencing architectural design orientations, land use, and construction methods.

Culture and History: The region's history and local culture significantly contribute to shaping the form and character of buildings and public spaces, embodying local identity in urban planning.

Population and Demographics: Urban planning is influenced by the population size and distribution in the city, directing planning to meet housing needs and infrastructure requirements.

Technology and Infrastructure: Technological advancements and infrastructure availability greatly impact urban planning, contributing to improved services such as transportation, energy, and communications.

Legislation and Government Policies: Government legislation and policies determine the rules and standards that urban planning must adhere to, including building codes, environmental protection, and land use regulations.

Economic Development: Urban planning is affected by the economic development of the city, directing investments and developing industrial and commercial areas based on population needs and local economy.

History and Evolution of Urban Planning Legislation

Beginning Urban Cities

The emergence of civilized dwellings dates back to ancient times. The beginning of human settlement was driven by the search for basic needs: food and shelter. Primitive humans relied on plants and hunting for food until they learned agriculture over ten thousand years ago, which significantly impacted human development, fostering communication, cohesion, exchange, and community formation in villages and colonies. This cooperation extended to neighboring communities, leading to the establishment of caravan trade routes. The intersections of these trade routes became points of attraction, where people gathered for exchange or permanent settlement, relying on crafts or servicing travelers. As these points grew and gained recognition, they attracted larger populations, evolving into villages, towns, and then cities. This growth necessitated the establishment of laws and ethical codes to regulate interactions and societal norms, forming organized communities.

Humans began creating shelters during the Paleolithic era, living in caves and simple huts. With the development of civilizations, more advanced materials like brick, stone, and wood were used for building homes. In some ancient cultures, the family was the basic unit of life, and homes were designed accordingly. As societies evolved, people gathered in cities and villages, with dwellings becoming part of urban clusters.

The Sumerian civilization in Mesopotamia during the Bronze Age (2000-4000 BCE) is considered one of the earliest to develop houses and urban clusters. They built homes from mud bricks, reeds, and clay, living in large urban conglomerations of interconnected small cities. Subsequent ancient civilizations, such as the Pharaonic civilization in Egypt, the Hindu civilization in India, and the Chinese civilization, all developed advanced dwellings and urban clusters. During the Middle Ages, governments and kings built castles and palaces as primary residences for the ruling class, while ordinary people constructed homes from wood, brick, and stone in cities and villages.

With technological and industrial advancements in the modern era, housing evolved, introducing new building

materials like concrete and stainless steel, and new methods for designing homes and urban clusters. Today, housing and urban clusters vary globally, from small rural homes to giant residential towers in major cities. Modern housing designs incorporate essential factors such as environmental sustainability, modern technology, aesthetic design, and basic needs like comfort, safety, and privacy.

Overall, the development of housing and urban clusters has been linked to the progress of civilization, technology, and economy, improving the quality of human life and providing a better and more luxurious living.

Stages in the Emergence of Urban Planning Laws and Regulations

Building and Urban Planning Laws and Regulations in the Early Ages (Pre-Legal Discovery Era:

When discussing the beginnings of land use control for privately owned lands, it remains an unknown mystery during the prehistoric period. Land was considered part of the concept of property rights, meaning it could not be controlled or subjected to specific restrictions or limited to particular uses. The owner had the right to exclude others from it, transfer ownership to others, and use it as they wished for their benefit

The Emergence of Urban Legislation and Early Laws

As civilizations evolved and states and governments emerged, some laws and regulations began to govern the construction of cities (residences and public buildings). Examples of this can be seen in the Middle Ages when some laws regulated city and housing construction, delineating rights, duties, and property- related taxes, all aimed at providing a suitable, safe, and healthy environment for inhabitants and public infrastructure. These laws and regulations vary from one country to another and are influenced by the economic, social, cultural, and environmental factors surrounding the communities in question.

Among the earliest kings to issue comprehensive laws in human history is King Hammurabi, who ruled Babylon between 1792 and 1750 BCE. His most famous decree, known as the "Code of Hammurabi, "comprised over 280 laws covering various aspects of life in Babylonian society, including construction. The "Building Law" issued by King Hammurabi is considered one of the important laws regulating the construction process and setting necessary standards for building and construction in Babylonian society. It is the first law for construction in history, marking a significant turning point in the history of construction. It led to better organization of the construction process and the determination of necessary standards for building quality and construction. Furthermore, it contributed to the unification of rules and regulations governing construction in Babylonian society through clear and precise instructions that regulated the construction process and defined responsibilities and rights for all parties involved in it.

Many instructions in the Babylonian Building Law emphasized the necessity of adhering to safety, quality, and sustainability standards in construction. This involved using appropriate materials, providing necessary support for buildings and structures, and specifying precise standards for designing and executing buildings and structures using suitable and available tools and materials in the region.

The issuance of the Babylonian Building Law was essential at that time, as construction was based on traditions and common practices in society, relying on available resources, expertise, and technical skills. This law improved the quality of buildings and construction, reduced incidents of collapse, increased the durability and sustainability of buildings and structures, and unified and organized rules and regulations governing the construction process, defining necessary standards for building quality and construction. It also contributed to improving the safety of workers and defining their responsibilities and rights in the construction process. This reflects the development witnessed by Babylonian society at that time and its interest in improving life and infrastructure. Indeed, the Babylonian Building Law continues to have a significant impact on current laws and regulations in the field of construction.

In general, current laws related to construction, building, and architecture are based on the principles and foundations of the Babylonian Building Law. They attempt to apply and modify them according to the current circumstances and challenges of the construction industry. Thus, the Babylonian Building Law still has a significant influence on current laws and regulations in the field of construction.

Laws evolved in various ancient civilizations, giving rise to Pharaonic building laws in the early ancient era (around 3000 BCE) to the late Roman era (around 300 CE). Differences between building laws that emerged in ancient civilizations vary in many aspects, including the nature of laws, existing systems and regulations, objectives, techniques, materials used, and the time period in which these laws emerged.

Building laws in ancient civilizations emerged at different periods in history, relying on the social, economic, and cultural requirements and needs of those civilizations. In the Babylonian civilization, building laws emerged from the third millennium BCE to the first century CE. In the Pharaonic civilization, building laws emerged from the early ancient era (around 3000 BCE) to the late Roman era (around 300 CE). In the Greek civilization, building laws emerged from the second millennium BCE to the first century BCE. In the Roman civilization, building laws emerged from the second century BCE to the fifth century CE. In the Chinese civilization, building laws emerged from the pre-imperial era (around 2100 BCE) to the modern era. In the Indian civilization, building laws emerged from ancient times to the modern era.

In Islamic civilization, building laws emerged from the seventh century CE to the present day, forming an essential part of the legal, constitutional, and Sharia systems of Islamic countries. They are characterized by a focus on functional, aesthetic, and environmental aspects of construction, achieving a balance between them, and relying on available materials in the region and the accumulated expertise of artisans and engineers in society.

In general, differences between building laws in ancient civilizations and the times in which they emerged reflect the development and progress witnessed by societies and civilizations throughout history. They rely on the social, economic, and cultural requirements and needs of those civilizations. It is important to benefit from the various experiences and experiments to improve and develop building laws to meet the needs of different communities in the present time.

The Zoning Law

Construction used to occur without any restrictions for a long time until leaders and rulers began to realize the importance of defining the uses of certain areas due to urban expansion and civilizational growth, as well as the limitation of some areas for specific uses to achieve the public interest of the society.

At the outset of legislation, laws focused on uses that posed dangers and threats to human life. Legislation was carried out in courts by proving the existence and extent of such uses, along with the severity of the dangers they posed. These issues were treated on a case-by-case basis in court, with each case being individually assessed to determine whether it posed a serious threat to public health, safety, and the general welfare of the people.

Over time, the evidence requested by courts to make determinations regarding the public interest and the severity of risks and threats to health and life increased. This included identifying harmful uses and assessing the possibility of allowing certain uses in specific locations. Courts began calling for comprehensive plans, and this call was heeded, leading to the development of zoning laws. This marked the beginning of zoning legislation.

For example:

In Spain:

it was part of King Felipe II's decree when he outlined the broad lines for building communities in the New World to designate places for slaughtering livestock on the outskirts of towns to keep the unpleasant odors away from the residents. This was part of the efforts made to improve the health and safety of consumed meat in the Spanish Kingdom in the sixteenth century. At that time, livestock slaughtering was done in the streets and public markets, leading to contamination of the meat with dust, dirt, and bacteria. In order to improve the situation, King Felipe II issued a decree in 1562 designating specific places for slaughtering livestock in various cities and villages in Spain

In United States

In Boston, a decree was issued to isolate gunpowder storage from the city center in 1774 in an official document called the "Proclamation of 1774." This decision was made following the riots in Boston, which became known as the "Boston Tea Party," to mitigate the risk. This was the first American document specifically dedicated to land use.

An American document establishing land use, known as the "Land Ordinance of 1785," was issued in the United States after its independence from Britain. This law was part of the American government's efforts to regulate land use in the new American West and to determine how land would be divided and sold to investors and citizens. This law resulted in the division of land in the western regions into small squares, with each square containing an area of 640 acres (2.6 square kilometers), which were then sold to investors and individuals at specified prices.

The Importance of Urban Legislation

Urban legislation, or laws related to urban planning and organization, aim to achieve the public benefit of society first, followed by the private benefit of individuals. They are considered an essential tool for organizing urban life and achieving sustainable development. These laws play a crucial role in improving the quality of life in cities and urban areas, justifying the imposition of restrictions on private properties for the public benefit in several key aspects, including: public health, security and safety, comfort, quality of life improvement, economy, aesthetics and ethics, natural resource conservation, housing provision, and sustainable development.

The Origin and Development of Urban and Building Laws in Egypt

Law no.51 of 1940

Law No. 51 of 1940 was issued as the first law addressing construction activities in Egypt. It was associated with the executive regulations issued by the high decree in December 1889. The general requirements in these regulations only pertained to public roads and alignment lines. However, the law itself addressed buildings and their relationship with the surrounding environment. It focused on considering the dimensions of buildings, the relationship between building height and road width, the minimum height for each floor, and the dimensions of internal courtyards designated for the ventilation and lighting of rooms and residential facilities. Additionally, it emphasized fire safety and firefighting measures.

Law No. 52 of 1940

This law was issued alongside Law No. 51 of 1940 to regulate the process of land parceling as a preliminary planning step before construction activities.

Law No. 656 of 1954

This law was issued to combine the high decree of 1889 and Law No. 51 of 1940 on the same subjects. It remained in effect for eight years and was amended several times, either by addition or modification, for improvement purposes.

Law No. 45 of 1962

This law did not differ much from its predecessor. It addressed road widths, building heights, courtyards, and projections, while also adding new requirements related to ventilation and lighting openings in buildings. Additionally, it included specific conditions for staircases to ensure the quality of the construction process.

Building Regulation Law No. 106 of 1976

The Building Regulation Law was issued in 1976, and its executive regulations were issued by the Minister of Housing under Decree No. 237 in 1977. It contained many detailed provisions related to construction activities and remained in effect alongside the Land Parceling Law No. 52 of 1940 until the Urban Planning Law No. 3 of 1982 was issued. Thus, the Building Regulation Law and the Urban Planning Law continued to operate until the Unified Building Law No. 119 of 2008 was enacted.

Unified Building Law No. 119 of 2008

The Unified Building Law No. 119 of 2008 was issued on May 11, 2008, by the People's Council in matters related to urban planning, civic coordination, and building regulation, replacing Law No. 106 of 1976 after a gap of more than thirty years. The legislators' considerations were focused on addressing delays in obtaining permits and users' inclination towards violating the law. Hence, Law 119 emphasized remedying these issues by obligating administrative authorities to issue permits within a period not exceeding 30 days and imposing stricter penalties for law violations, as well as specifying certain cases not subject to reconciliation but requiring demolition.

The executive regulations were issued by the Minister of Housing under Decree No. 144 of 2009, with the latest amendments being made under Ministerial Decree No. 109 of 2013.

The Unified Building Law consists of six legal articles, aiming to regulate urban planning, civic coordination, building activities, and preservation of real estate wealth. It emphasizes prohibited areas for construction and exceptions to this prohibition. Several laws were repealed upon the issuance of the Unified Building Law, and it delineates the responsibilities and authorities entrusted with implementing its regulations and provisions.

The law is structured into five chapters:

Urban Planning.

Civic Coordination.

Building Regulation.

Preservation of Real Estate Wealth.

Penalties.

The new licensing system (2020):

Ministerial Decision No. (318) of the year 2020 was issued to suspend construction activities in the capitals of governorates and major cities for a period of six months. This decision aims to review the permits issued, scrutinize existing building permits, and ensure compliance with regulations to eliminate informal construction and curb permit chaos. Construction projects already underway are allowed to continue based on their existing permits without deviation. The expected outcomes include deterring violators, reviewing the safety and compliance of buildings with standard specifications, codes, and regulations, as well as preserving state-owned lands from encroachment and agricultural lands from excavation.

This study aims to discuss how building laws address the factors influencing cities and consequently impact the urban form and fabric of Egyptian cities. It compares the differences and developments in the law concerning these points. As previously mentioned, the shape of a city is affected by several factors such as the geographical nature of the city's location, the surrounding environment, climate, cultural and historical dimensions of the area, as well as population size, which directly influences population density.

We find that building laws in Egypt have only addressed rigid and uniform engineering dimensions, regardless of the differences among cities, regions, and their surrounding conditions. The focus has been heavily on building heights, their relationship with road dimensions, courtyard dimensions, openings, and parking spaces. The following is a review of how these factors are addressed in the building laws issued in Egypt and their treatment of these topics.

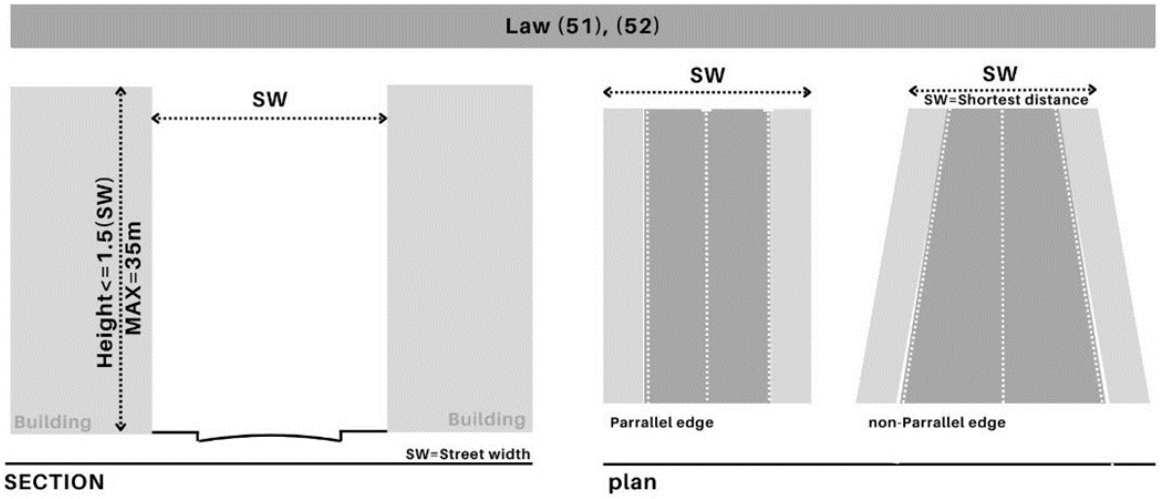
Study of the Engineering Dimensions Addressed in the Law

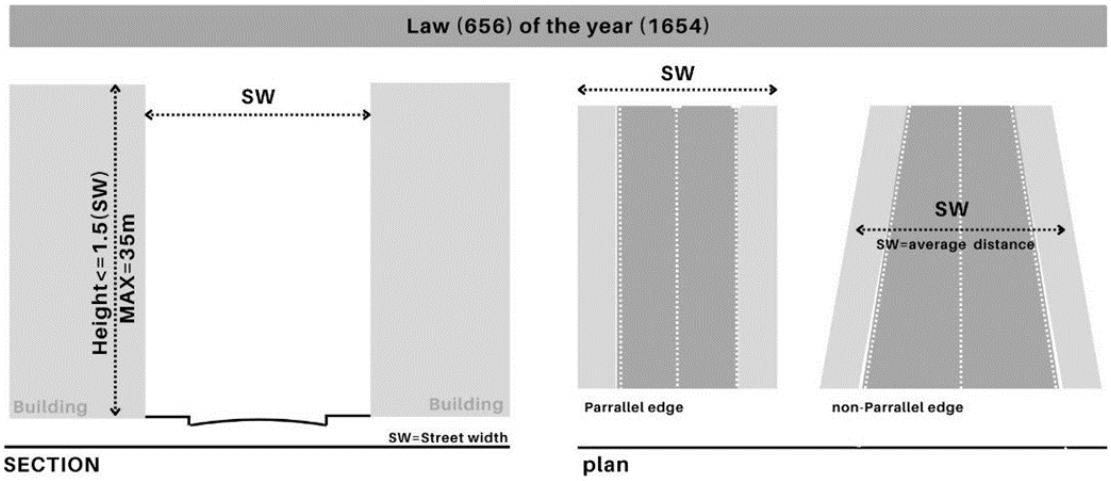
The building laws, concerning the elements influencing the external shape of the city, focused on specifying dimensions for road widths and building heights, which are linked to road widths, as well as courtyards, light wells, and protrusions. Below is a comparison of the key elements affecting the external shape that were mentioned in the building laws, highlighting their differences across different versions of the laws.

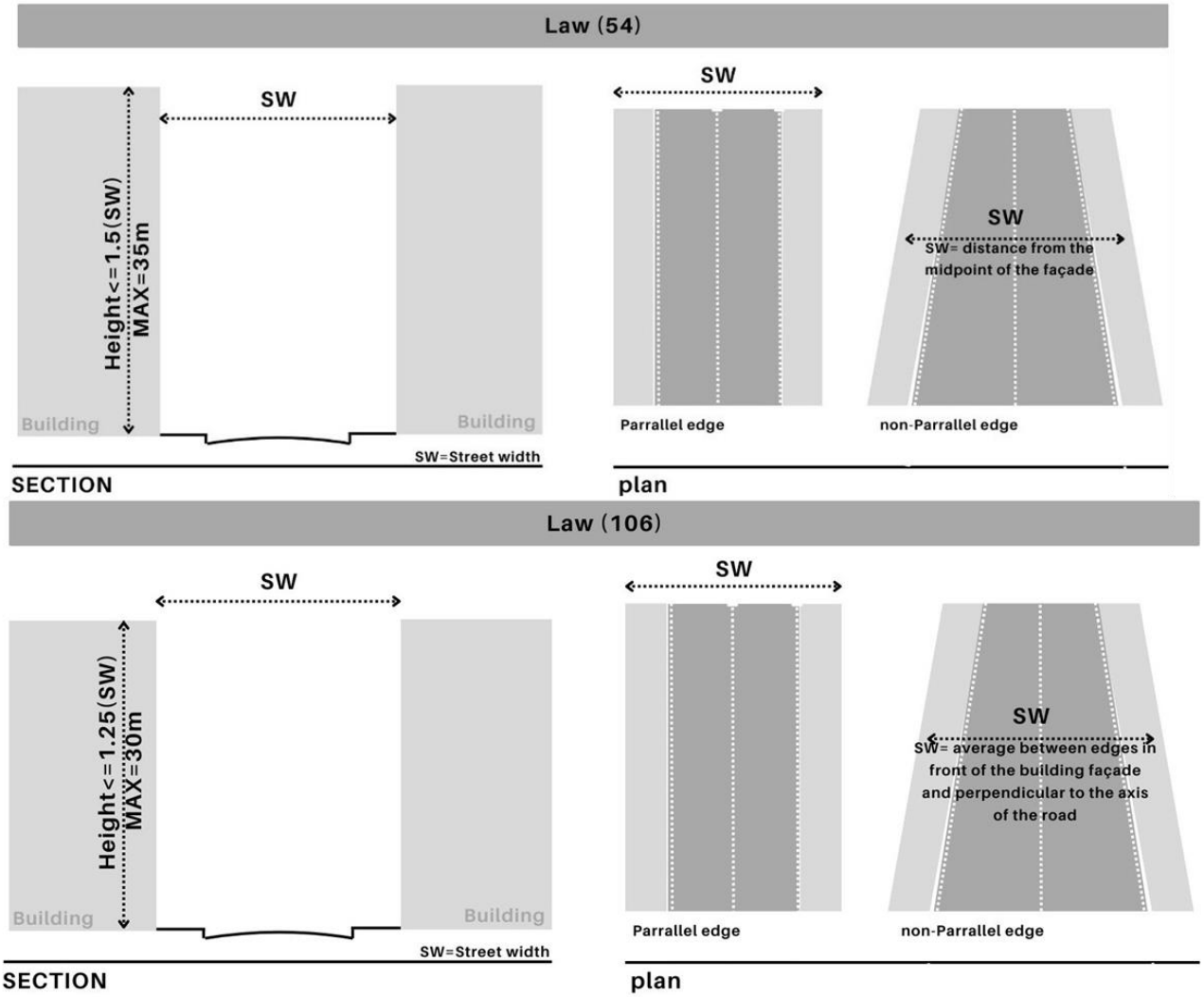
Heights

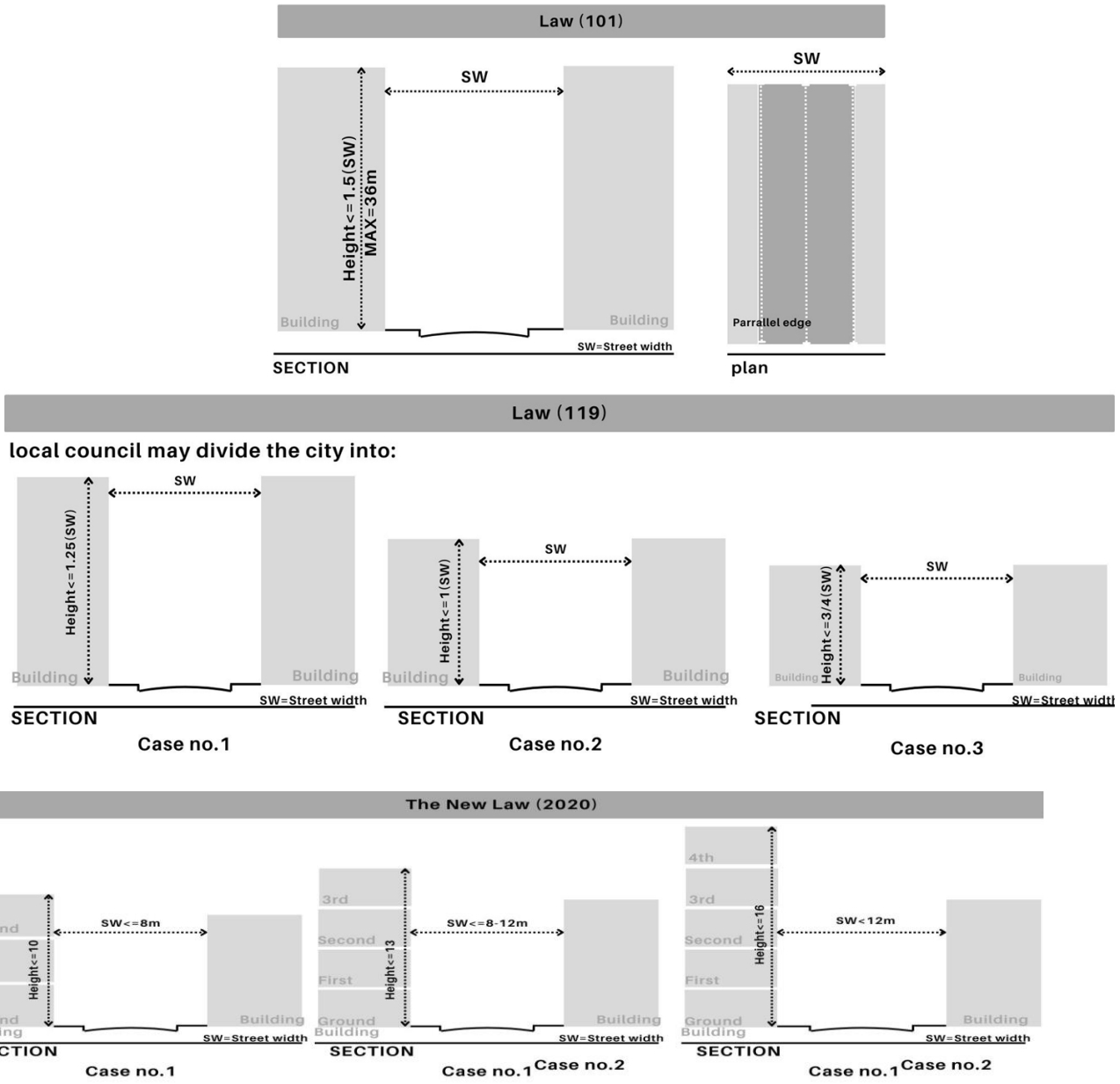
Law number	heights
Law (51), (52)	The height does not exceed one and a half times the width of the street, Maximum height (35m)
	In case of non-parallel road edges the reference is the shortest distance between the road edges
Law (656) of the year (1654)	The height does not exceed one and a half times the width of the street, Maximum height (35m) In case of non-parallel road edges the reference is the average distance between the road edges
Law (54)	The requirements have not changed In the case of non-parallel roads, the height is measured in front of the midpoint of the façade, measured from the level of the sidewalk or the road surface if there is no sidewalk
Law (106)	The total height does not exceed one and a quarter times the distance between the road edges, Maximum height (30m) And it is measured from the average distance between the road edges in front of the façade, perpendicular to the axis of the road In the case of non-parallel road edges, the width of the road is calculated based on the average between its edges in front of the building façade and perpendicular to the axis of the road
Law (101)	The total height does not exceed one and a quarter times the distance between the road edges And it has been modified to be one and a half times the width of the road , Maximum height (36m) With a tolerance ratio for exceeding in some cases within the limit of (3%) upon approval from the governor
Law (119)	The local council may divide the city into: 1. The total height does not exceed one and a quarter times the distance between the road edges 2. The total height of the building facade does not exceed the distance between the road edges 3. The total height of the building facade does not exceed three-quarters of the distance between the road edges.

The New Law (2020)	○ In the case of streets less than (8) meters wide, the maximum building height must be (10) meters, equivalent to the height of (ground floor + two floors). ○ In the case of streets narrower than (8-12) meters, the maximum building height must be (13) meters, equivalent to the height of (ground floor + three floors) ○ In the case of streets wider than (12) meters, the maximum building height must be (16) meters, equivalent to the height of (ground floor + four floors)






Law (54)
SW
Height<=1.5(SW)
MAX=35m
Building
Building
SW=Street width
SECTION
SW
Parrallel edge
SW
SW= distance from the midpoint of the façade
non-Parrallel edge
plan
Law (106)
SW
Height<=1.25(SW)
MAX=30m
Building
Building
SW=Street width
SECTION
SW
Parrallel edge
SW
SW= average between edges in front of the building façade and perpendicular to the axis of the road
non-Parrallel edge
plan



Density

Law number	Building density
Law (51), (52)	The law does not specify density
Law (656) of the year (1654)	The law does not specify density
Law (54)	The law does not specify density
Law (106)	It is the first building regulation law to specify building density, as it stated in its executive regulations that building density ratios should not exceed the following proportions: 2 for plots of land facing roads with widths of (12) meters or less 2.5 for land parcels bordering roads with widths ranging between 12-15 meters 3 for land parcels bordering roads with widths ranging between 15-20 meters 3.5 for land parcels bordering roads with widths ranging between 20-25 meters 4 for land parcels bordering roads with widths exceeding 25 meters

Urban Planning Law No. (3) of the year (1982)	The Urban Planning Law No. (3) of the year (1982) was issued, along with its executive regulations, which annulled the density clause from the Building Regulation Law and incorporated it into the Urban Planning Law. It set the maximum density limit as follows: 5 for downtown areas 4 for any other area outside the downtown 2 for new cities and urban extensions of existing cities
Law (101)	Not exceeding (2) for parcels with a width of (12) meters. Not exceeding (2.5) for parcels with widths ranging from (12-15) meters. Not exceeding (3) for parcels with widths ranging from (15-30) meters. (3.5) for parcels with widths ranging from (20-25) meters. (4) for parcels with widths exceeding 25 meters. A decision n.(78) of the year (1993) was issued, and Law (101) regarding building heights is as follows: 1.25 times the width of the road with a height of 1 time the width of the road. 2 times the width of the road with a height of 0.75 times the width of the road.
Law (119)	In existing cities: (5) in downtown areas. (4) in any other area outside the downtown. (2) in new cities and urban extensions of existing cities.
The New Law (2020)	It did not address densities and remained as per Law 119.

Public roads

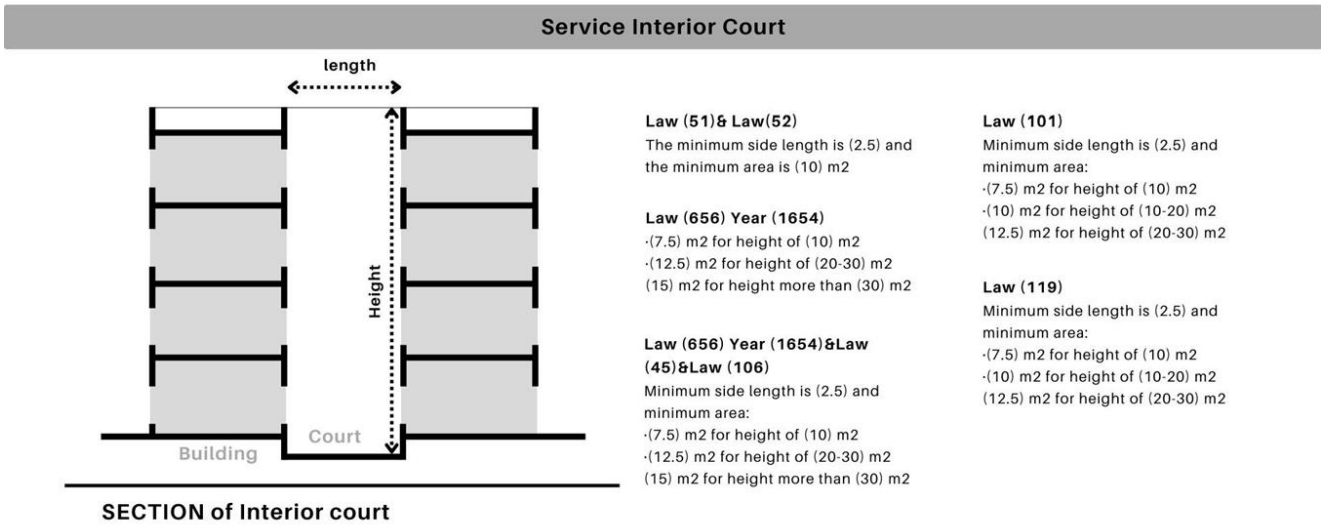
Law number	Public roads
High Order issued in (1889)	A text concerning the demolition of structures and awnings erected over public roads. Setting the minimum width for roads as follows: • Major streets in Cairo and Alexandria should have a width of no less than 12 meters, while in other cities it should be 8 meters. • Road extensions range between 4 to 6 meters. • Dead-end alleys (non-through) should be 3-4 meters wide.
Law (51), (52)	The High Order issued in (1889) was still in effect alongside them.
Law (656) of the year (1654)	The previous regulation was abolished, and its new regulation stipulated that the width of the road should not be less than 6 meters. If it is less than that, the building setback should be equal to half the difference between the existing road width and 6 meters.
Law (45)	The executive regulations stipulated that certain provisions were suspended (postponed from being applied), with the condition that the width of the road should not be less than 8 meters. If the width falls below the prescribed limit, the building setback should be equal to half the difference between the existing road width and 8 meters.
Law (119)	Cities: • 4 meters for internal roads. • 6 meters for main roads. • 8 meters for circular roads. Urban extensions: 6 meters. Economic, commercial, and service areas: Consideration should be given to: 1. The capacity of streets, sidewalks, loading and unloading areas, and public and private transport systems in the area. 2. The volume of traffic generated by the permitted uses in the area, including pedestrians, private cars, and transportation according to Article (36). Design of craft areas: Minimum width: 12 meters. Design of industrial zone pathways: Providing additional lanes for vehicles exiting from the highway and considering the gradual structure of the road network (local roads - collector roads - industrial roads).
The New Law (2020)	The roads were not addressed and remain valid as stated in Law No. (119) of the year (2008)

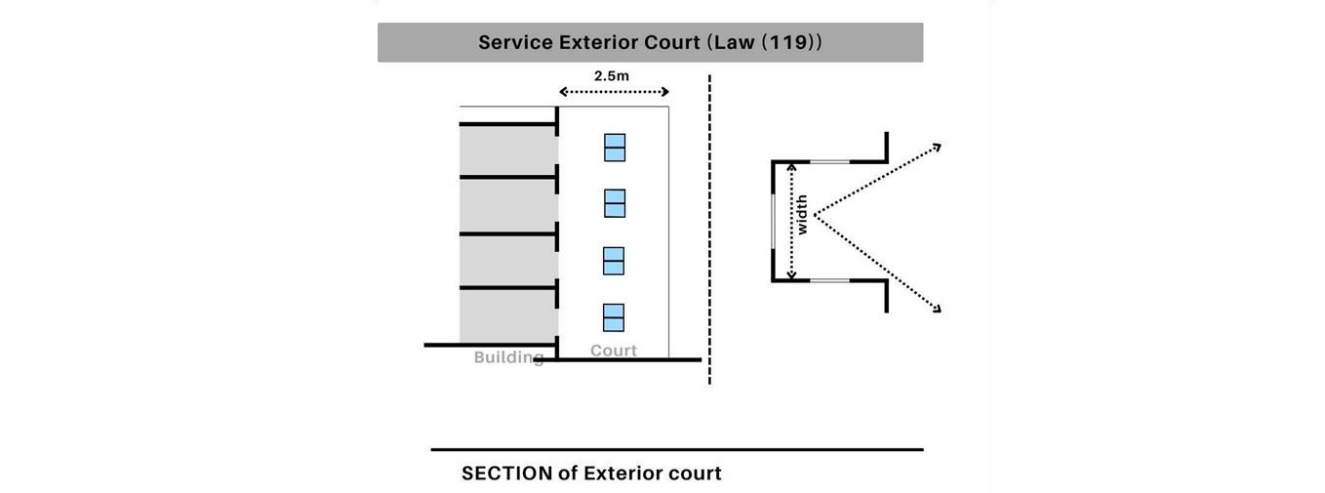
Law (51), (52)	---
Law (656) Year (1654)	---
Law (45)	---
Law (106)	Compliance with providing parking spaces should be ensured, suitable to the number and area necessary for them and the purpose of the building. The parking should accommodate one car for each residential unit of the building and two cars for each administrative housing unit, unless a decision is issued by the relevant governor determining the necessary parking space according to the building's level and type of use.
Law (101)	
Law (119)	Parking spaces should be provided according to the garage code and planning requirements. Craft Areas: • Provide parking for every 100 m2 of building area, not including the buffer zone between residential and craft areas, which should be not less than (20 m). Industrial Areas: • The area of roads and collective parking spaces outside the industrial area should not be less than (25%) of the total industrial area. • Cars should not be parked on the sides of the roads within the industrial area. • Ensure the allocation and preparation of parking spaces for loading, unloading, and waiting for all types of vehicles within the boundaries of the plot of land, with their ratios determined according to the activity.
New Law (2020)	It does not include parking spaces, and they remain in effect as stated in Law (119) of the year (2008) and according to the amendments made to the garage code.

Service courtyards (for bathrooms and kitchens)

Law	**Service courtyards (for bathrooms and kitchens)**	
	Interior	**Exterior**
Law (51), (52)	The minimum side length is (2.5) and the minimum area is (10) m2	**---**
Law (656) Year (1654)	The minimum side length is (2.5) and the minimum area: • (7.5) m2 for height of (10) m2 • (12.5) m2 for height of (20-30) m • (15) m2 for height more than (30) m	---
Law (45)	Same as the previous law (656)	---

Law (106)	Same as the previous law (656), and he added that in the case of hotels and hospitals where artificial ventilation is not available, the courtyard designated for lighting and ventilation of bathrooms should have an area of (1.5) m2, with neither of its dimensions being less than (1) m	---
Law (101)	The minimum side length is (2.5) and the minimum area: • (7.5) m2 for height of (10) m2 • (10) m2 for height of (10-20) m • (12.5) m2 for height of (20-30) m	---
Law (119)	The minimum side length is (2.5) and the minimum area: • (7.5) m2 for height less than or equal (10) m2 • (10) m2 for height less than or equal (20) m • (12.5) m2 for height less than or equal (30) m The area increased by (2.5) m2 for each (10) m increase in height	Minimum side length is (2.5) m
New Law (2020)		



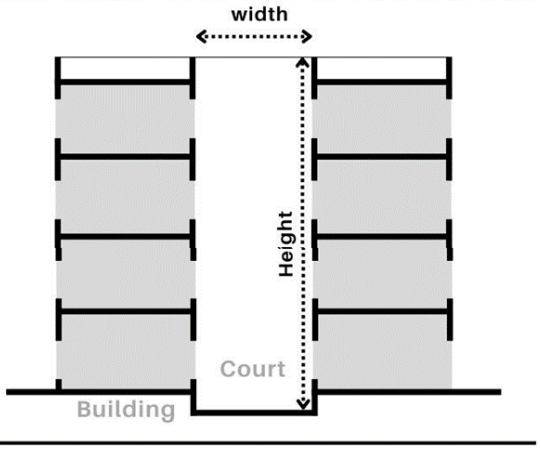


Rooms and Offices courtyard

Law	Rooms and Offices courtyard	
	Interior	Exterior
Law (51), (52)	The minimum side length is (1/3) of the building height and minimum area is (1/3)^2 of building height	---
Law (656) Year (1654)	Minimum side length is (1/4) of the maximum building height with a minimum height (2.5) m and the minimum area is (2/5) of the maximum building height with the minimum area (10) m2	Minimum side length is (1/4) building height or with minimum length (2.5) m
Law (45)	Same as the previous law (656)	Same as the previous law (656)
Law (106)	Minimum side length is (1/3) of the maximum building height with a minimum length (3) m and the minimum area is (1/5)^2 of the maximum building height with the minimum area (12) m2	The minimum side length is (1/3) of the maximum building height or with a minimum length (3) m
Law (101)	--	The minimum area is (1/3) of building height or (3) m which is taller

Law (119)	Minimum side length is (1/4) of the building height or (3) m which is taller and the minimum area is (1/4) of the building height or (9) m which is taller	(0.25) building height or (3) m which is taller
New Law (2020)	The requirements have not changed.	The requirements have not changed.

Law (51), (52)

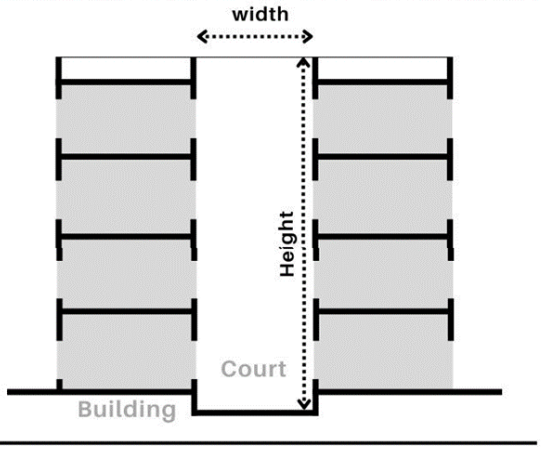


SECTION of Interior court

W=width
H=width

Minimum w=(1/3)H
Minimum Area=$((1/3)H)^2$

Law (656) Year (1654)

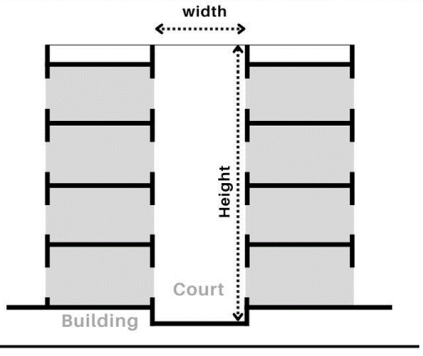


SECTION of Interior court

W=width
H=width

Minimum w=(1/4)H
Minimum Area=((2/5)H)
minimum Area=$10m^2$

Law (119)&New Law (2020)

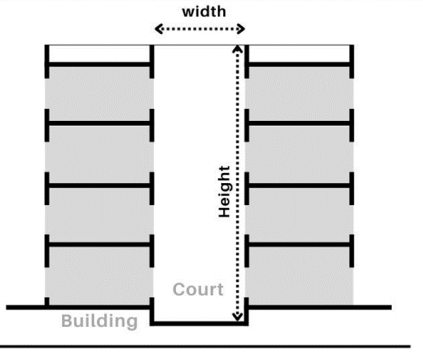


SECTION of Interior court

W=width
H=width

Minimum w=(1/4)H
minimum w=$3m^2$
Minimum Area=$((1/4)H)^2$
minimum Area=$9m^2$

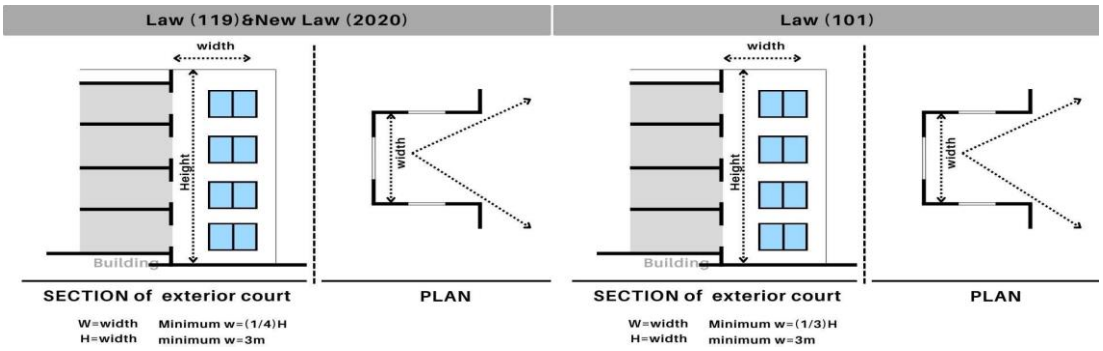
Law (106)

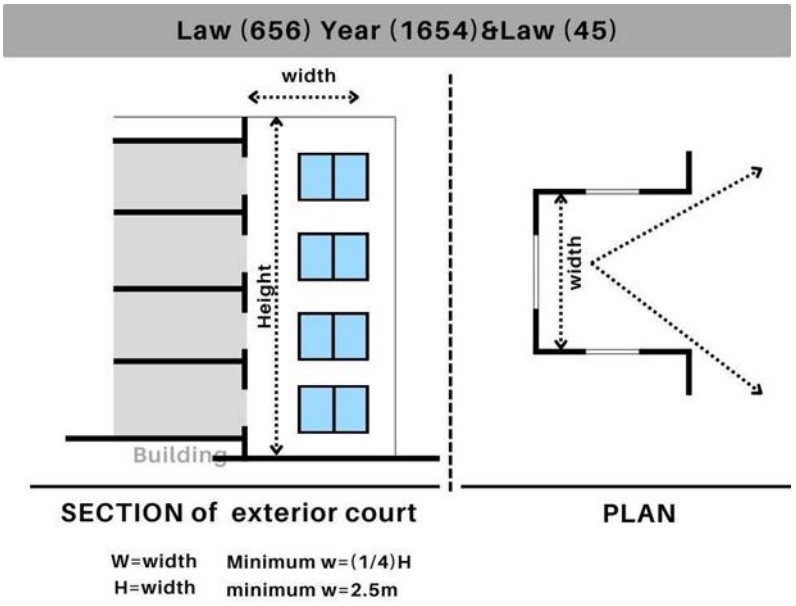


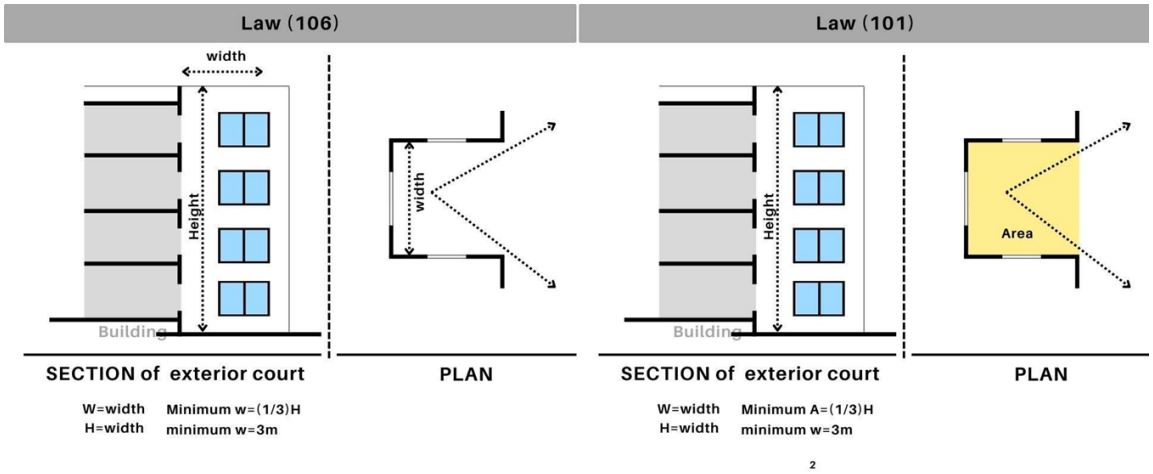
SECTION of Interior court

W=width
H=width

Minimum w=(1/3)H
minimum w=3m
Minimum Area=$((1/5)H)^2$
minimum Area=$12m^2$



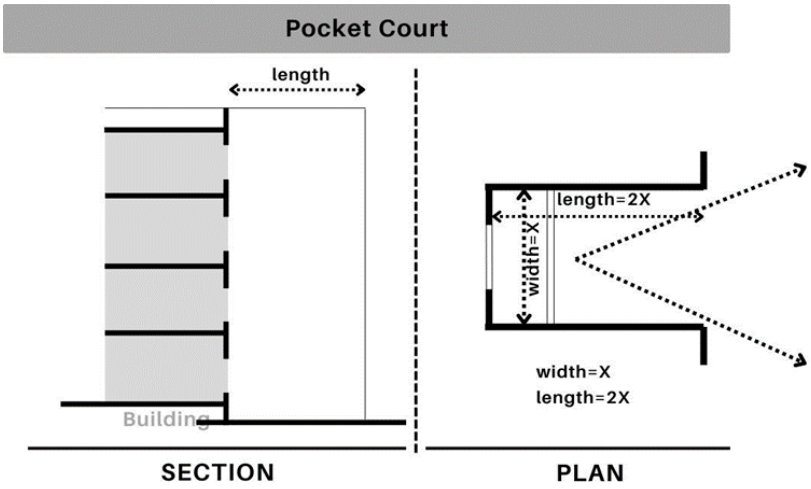




2

POCKET COURTYARD AND PROTRUSIONS

Law	Pocket courtyard and protrusions	
	Pocket courtyard	protrusions
Law (51), (52)	---	The High Order of 1889 stipulated in its executive regulations that: -Balcony protrusions should not exceed 50 cm for streets less than 6 meters wide. -Balcony protrusions should not exceed 1 meter for streets wider than 6 meters. Laws 51 and 52 did not address this matter due to the simultaneous implementation of the executive regulations of the High Order.
Law (656) Year (1654)	The depth of the pocket vestibule shall not exceed twice its width, and the window shall face the road or the courtyard that the vestibule overlooks. The depth of the balcony shall not exceed half the minimum width of the vestibule.	The balconies shall not protrude more than 10% of the width of the road, with maximum protrusions of 1.25 meters. Similarly, tower projections shall not exceed 5% of the road width, with a maximum of 1.25 meters. The length of these projections shall not exceed half the length of the façade. These protrusions must be at least 4 meters away from the sidewalk surface, leaving a clear space of 1.5 meters without any protrusions from neighboring properties. Canopies are allowed to extend up to an additional 25 cm beyond the protrusions, and no projections are permitted within the outer courtyard.
Law (45)	The requirements have not changed	The requirements have not changed.
Law (106)	The setback depth shall not exceed twice its minimum width, and balconies may be constructed within the setback up to half of its minimum width.	The requirements have not changed.
Law (101)	The requirements have not changed.	The protrusions on the ground floor shall be at a minimum height of 2.5 meters above the sidewalk level and shall not extend more than 10 cm beyond the facade line. The exposed projections of balconies shall not exceed 10%, and tower projections shall not exceed 5%.
Law (119)	The setback depth shall not exceed twice its minimum width, and balconies may be constructed within the setback up to a quarter of its minimum width.	The requirements have not changed.
New Law (2020)	The requirements have not changed.	The requirements have not changed.



RESEARCH RESULTS AND CONCLUSION

Research results

Theoretical RESULTS

- Urban formation encompasses all physical elements (buildings, streets, roads, and site coordination) that shape a city's development and visual image, influenced by geographical, social, and cultural aspects.
- Elements of architectural and urban design that affect the shape and formation of urban planning in a city include (Natural Terrain- Climate and Environment- Culture and History- Population and Demographics- Technology and Infrastructure- Legislation and Government Policies- Economic Development).
- Civilized dwellings emerged in ancient times in the search for food and shelter. Primitive humans relied on plants and hunting until they learned agriculture over ten thousand years ago, which enhanced communication, cohesion, and the formation of villages. Cooperation between communities led to the establishment of caravan trade routes, and their intersections became points of attraction for exchange or permanent settlement. These points grew into villages and then cities.
- King Hammurabi of Babylon (1792-1750 BCE) was one of the earliest monarchs to implement comprehensive laws in human history. His "Code of Hammurabi" included over 280 laws that addressed various aspects of Babylonian life, including construction.
- Urban legislation prioritizes public benefit over private benefit, organizing urban life and promoting sustainable development. These laws improve city life by justifying restrictions on private properties for public health, safety, comfort, quality of life, economy, aesthetics, ethics, resource conservation, housing, and sustainability.
- Building regulations are of utmost importance in regulating construction operations and play a fundamental role in influencing the shape and pattern of urban development.
- Building regulations play a crucial role in supporting and incentivizing engineers to achieve principles and trends towards sustainable urban development, utilizing modern technologies and principles of green architecture to conserve resources, protect the environment, and achieve optimal building efficiency.
- Building regulations also play a significant role in enhancing the cultural, geographical, climatic, and economic dimensions specific to each region.
- Development of Urban and Building Laws in Egypt start with law no.51 of 1940 was issued as the first law addressing construction activities in Egypt until now follows:
    1. Law no.51 of 1940
    2. Law No. 52 of 1940
    3. Law No. 656 of 1954

4. Law No. 45 of 1962
5. Law No. 106 of 1976
6. Law No. 119 of 2008
7. new licensing system (2020)

Analytical Results

- The state has shown interest in updating and revising building regulations, and issuing new laws according to emerging variables. However, insufficient attention was initially given, as evidenced by the over thirty-year gap between Law No. (106) of 1976 and Unified Building Law No. (119) of 2008, leading to discrepancies with societal changes.
- Recently, the state has shown greater interest in building regulations, issuing the Building Law in 2008 followed by the issuance of executive regulations, reconciliation laws, and a new licensing system within a shorter period (14 years) compared to the previous period.
- The current legal texts adopt generalized engineering and material dimensions across various geographic regions and territories.
- Building laws in Egypt have not addressed the cultural identity and distinctive architectural character, thus failing to preserve the architectural identity of various geographic regions.
- Exclusion of different types of buildings in building laws and focus on residential buildings.
- The state has issued laws to address emerging developments resulting from political, social, and health-related changes, etc. (such as successive revolutions and the COVID-19 pandemic), impacting urban planning with issues like encroachments, violations, and others, such as the new licensing system.
- The research discusses the study and analysis of the geometric dimensions addressed by building codes, which influenced the shaping of buildings and consequently the shaping of the city:
    - The heights of buildings have changed slightly throughout Building regulations issuance, yet these changes have had a significant impact on city-shaping. Building regulations began to emphasize vertical expansion, with a radical change in heights occurring with the introduction of the new licensing system, which set a maximum height of 16 meters.
    - The change in maximum height limits in building codes led to a diversity in building heights in Egyptian cities, impacting city formation. Heights started being regulated with maximum limits of 1.5 times the road width (35 meters), then reduced to 1.25 times the road width (30 meters), and finally to a maximum of 16 meters.
    - Increased densities noted in building regulations are due to reliance on vertical expansion and the issuance of the new licensing system, which reduced height limits to 16 meters. It is expected that densities will decrease as there is a shift towards horizontal expansion.
    - With the continuous increase in the use of transportation means such as private cars and public transport since the beginning of building regulations, their regulation and consideration began with Law No. (106) and recently in the Unified Building Law (119). It stipulated that compliance should be made with providing parking spaces according to the Egyptian Garage Code, which is periodically adjusted based on demand studies.
    - The dimensions and areas of all courtyards were directly linked to the heights of buildings, except for external corridors, which were defined by minimum width without specifying an area. Similarly, pocket corridors were defined by their lengths only, without specifying dimensions for their widths.

CONCLUSION

In conclusion, the study underscores the critical role of urban and building laws in shaping the physical and cultural landscapes of cities, using Egypt as a lens. From ancient settlements to modern metropolises, regulatory frameworks have evolved to balance public welfare with private interests, fostering sustainable urban growth. The historical review of Egypt's legislative journey reveals periods of adaptation and reform, reflecting shifts in societal needs and technological advancements. Moving forward, ongoing revisions and enforcement of building

regulations must prioritize cultural preservation alongside modernization efforts, ensuring cities evolve harmoniously with their heritage and environment. By addressing current challenges through comprehensive legal frameworks, cities can aspire to achieve resilient, inclusive, and culturally rich urban environments for future generations.

Future Studies

- **Impact of Building Regulations on Sustainable Development:** A comprehensive study on how building regulations in Egypt influence the achievement of sustainable practices in urban development, with a focus on environmental, economic, and social sustainability.
- **Preserving Cultural Identity through Building Regulations:** An analytical study evaluating how building regulations in Egypt adapt to preserve the cultural identity of cities, emphasizing historical, artistic, and architectural factors.
- **Political Transformations and their Impact on Building Policies:** Research on how political and social changes in Egypt affect the evolution of building regulations, with a focus on legislative and executive shifts in recent years.
- **Technology and Innovation in Urban Legislation:** A study on the use of modern technology and innovations in developing and implementing building regulations, highlighting the role of artificial intelligence and light analytics in enhancing environmental efficiency in cities.
- **Comparative Analysis of Building Policies in Egypt and Other Arab Countries:** A comparative study examining building regulations and their impacts on urban development in Egypt compared to other Arab countries, focusing on similarities, differences, and practical applications.
- **Impact of Crises and Social Changes on Building Policies:** Research on how building regulations in Egypt respond to challenges arising from political and social crises such as successive revolutions and the COVID-19 pandemic, with a focus on emergency amendments and their impacts on shaping and developing cities.

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