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Sustainable Architectural Pluralism Through Contemporary Architectural Design

Abstract

Architectural pluralism is an architecture that would adopt the 'local character', which is not only concerned with the geographical aspects but also the oblique way of life (the historical and cultural forces). While contemporary architecture is a term used to describe the current architectural styles present in today's architecture; it is usually a form of construction that represents a wide range of building styles and designs originated or inherited from various influences. Considering the previous, this research aim is to investigate how pluralistic architecture could be found in contemporary architecture through implementing sustainability and its relation to the design morphology adopted by other contemporary architectural themes. It is intended to discuss different themes of contemporary architecture and highlight their design characteristics through analysis of 3-case studies that were presented to discuss in depth the features of these two themes. The study special focused on their contribution to providing a sustainable environment. The findings of this study indicated that pluralism in architecture is highly present in contemporary architecture, toward coping with community changes.

Keywords: Architectural pluralism, sustainability, Architecture and Technology, Contemporary Architecture.

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1. Introduction

Architectural pluralism is an architecture that would adopt the ‘local character’, which is not only concerned with the geographical aspects but also the oblique way of life (the historical and cultural forces) [1, 2]. While contemporary architecture is a term used to describe the current architectural styles present in today’s architecture; it is usually a form of construction that represents a wide range of building styles and designs originated or inherited from various influences [3].

Considering the previous, this research aims to investigate how pluralistic architecture is found in contemporary architecture through implementing sustainability, and its relation to the design morphology adopted by other contemporary architectural themes. It is intended to discuss different themes of contemporary architecture and highlight their design characteristics. through a qualitative comparative analytical study of three-main buildings; to discuss in depth the features similarities and differences [4], of these two themes; with a special focus on their contribution to providing a sustainable environment.

2. Architectural Pluralism

Architectural pluralism means creating architectural designs that respect and includes different cultural needs, practices, and customs [5]. The term ‘pluralism’ was first introduced in architecture by Christian Norberg Schulz in his famous book 'Meaning in Western Architecture' (published in 1974). He argued that the term ‘pluralism’ was introduced as an emerging philosophical movement in the West after the world wars, which resulted in a lost belief in universal solutions. This idea was later translated into architecture as a revolution against the modernism movement, which adopted what became known as the 'international style' [1]. He also claimed that the architecture of the modern movement can be considered as 'spiritually dead' architecture.

Therefore, the aim of the pluralism movement is to deliver an architecture that can obtain individual characterization from the concept of place and time. The architecture that uses plurality can inherit from historical tradition, however, this inheritance takes place on many levels, and there is not a definite common way by which it takes place [2].

> “*If the architecture of the age of the machine expressed function, the architecture of the age of life expresses meaning. The plurality of life is the plurality of genes. Differences are precisely the proof of life's existence, and it is these differences which create meaning . . .”*
>
> (Jencks & Kropf, 1997) [2]

2.1. The Notion of Contemporary Architecture

The main concept of contemporary architecture revolves around rejecting the modern style. Furthermore, it provides a more unadulterated vision that is created by the 'ideological changes' that resulted in the establishment of democracies around the world and led the architects to teleport to less luxurious buildings' designs [3].

The complex nature of contemporary architecture originates mainly from both, the symbolically mute elements of industrial production adopted from 'Modernism', and the expandable historicist and high-tech signs of the industrial movement adopted from the Modern Eclecticism [2, 3, 6]. Different from the modern architecture that was dominant in Europe and the United States only, contemporary architecture is dominant across the whole world [3].

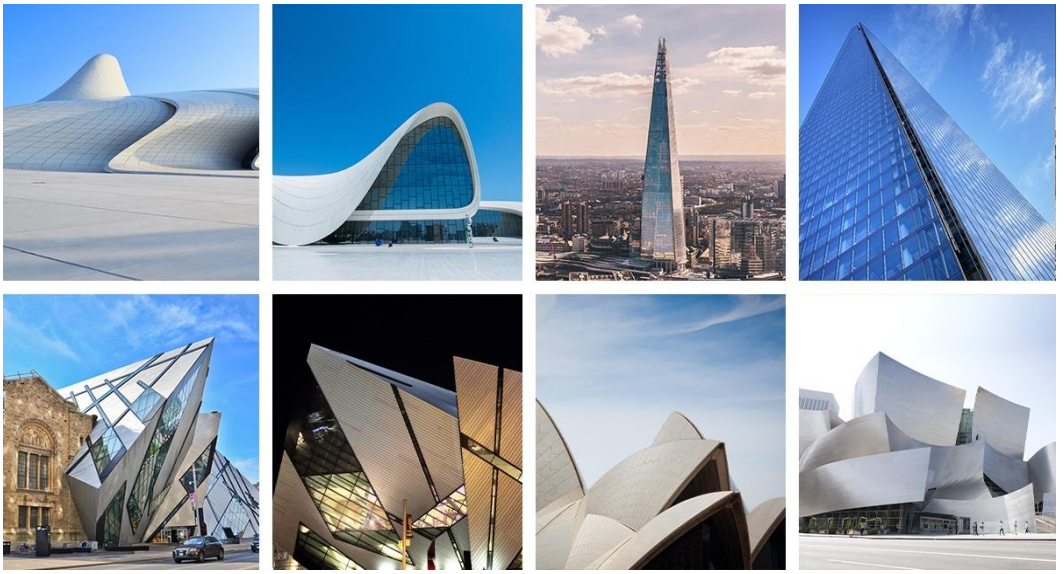

fig. 1 Contemporary architectural buildings [7]

Recently, with the use of new design software and the use of simulation techniques, buildings can be designed with very high accuracy and complexity that did not come in handy in previous eras. These computer-aided applications helped take architectural designs to a new era of three-dimensional modelling of structures, which allows architects to see and test the buildings before they are built [3]. Aside from the employment of different architectural styles and influences, contemporary architecture is different from late twentieth-century modern architecture; it includes eco-friendly, high-tech, complex structures, innovative materials, and sustainable features, which embrace all kinds of creativity (as seen in fig. 1) [3, 8, 6]. This is achieved through innovative architectural design solutions that are energy efficient and use recycled materials for most parts of the construction process [8].

2.1.1 Characteristics of Contemporary Architecture

Most features of contemporary architecture are inspired and adapted from the twentieth-century modern architecture movement, which includes 'clean lines' and 'neatness'. However, healthy Pluralism in today's architecture takes into consideration community change and the recent cultural preferences, economic, and environmental transformations, in addition to the technological evolution [7, 9]. The contemporary architecture incorporates innovative architectural strategies and innovative characteristics with a high degree of expressiveness of forms and designs. Previous literature highlighted its different themes as below:

- Contemporary Architecture is more noticeable and appreciated, it is well known for its high creativity and free-flowing forms that encompass extensive use of curved lines, high aesthetic sense, and emphasis on the design of structures. In addition, the vast range of material combinations can bring out contrast or uniformity [3, 6, 7]; A single building could be built with a combination of concrete, glass, aluminium screens, and multiple other materials. The innovativeness comprises the use of 'asymmetric facades' and 'crystal-like facets' that can alter colours according to the sun's orientation along the day [7, 3].
- As a result of the climate change impacts and the growing literature tackling the significance of adopting different strategies to solve the world's environmental challenges. Contemporary architecture adopts and encourages different approaches toward a sustainable environment. This is achieved through the design of energy-efficient and eco-friendly buildings [3]. Various innovative strategies were adopted such as implementing green roofs and vertical gardens with high wall-to-window ratio; most of the contemporary architectural buildings are designed with a higher degree of natural lighting entering the indoor spaces and thus, reducing the energy used in artificial lighting and the air conditioning throughout the day, the incorporation of recycled materials in most of the parts of the construction process. In addition, it considers passive and active strategies throughout the design process, especially using solar cells as the roofing material [3, 7].
- In addition, the excessive technological evolution had a huge effect on contemporary architecture, which introduced integrated smart and intelligent building technologies, as well as kinetic and dynamic architectural buildings [7].

2.1.2 Themes of Contemporary Architecture

Several researchers explained contemporary architecture as an architectural style that comprises many themes. These are postmodernism, high-tech architecture (structure expressionism), expressionism, deconstruction (deconstructivism) in architecture, folding in architecture, neo-modernism, sustainable architecture, and minimalism. According to the analysis of literature and data collection, a comprehensive analysis of the themes is presented in table 1.

Table 1. Themes of Contemporary Architecture, after [9, 10, 2, 11, 12, 13, 14, 15]

	Definition	Characteristics	Image
Post Modernism	Postmodern architecture is a form of eclectic and colourful architectural style. It mainly appeared in the late seventies and is still used up today [10] Postmodernism started to appear as a way of contradicting modernism and traditionalism. However, it consists of a mix of elements adopted from both styles [2].	Characterized by bright colours, playfulness, classical motifs, and variety of materials and shapes [10]	 fig. 2 Sainsbury Wing **[16]**
High-tech Architecture	It is mainly influenced by the new technologies and the engineering revolution. High-tech architectural style is mainly characterized by emphasizing the building's structure [10]	Often painted in bright colours, a smooth and impermeable skin (often of glass), large and Flexible interiors, expressed construction, coloured pipework and services, the use of prefabricated elements, glass walls and steel frames, and lightweight construction [10].	 fig. 3 The Hearst Tower **[17]**
Sustainable Architecture	Sustainable buildings should have a positive impact on the environment, associated with construction and the building life cycle, and contribute to enhancing the social environment they inhabit. This should be done by addressing people's needs (physical, psychological, and well-being), while enhancing their surrounding environment. Besides, they should have small ecological footprints [12]	Have Sustainable site design, water conservation, and quality, energy and environment, indoor environmental quality, and conservation of materials and resources [11]	 fig. 4 One Central Park **[18]**

Expressionism	This architectural style was first developed in Europe in the early 20th century [19, 13]. It is hard to be characterized [19]. However, one can describe it as an "expression of angst, subordination of objectivity and realism in favour of the symbolic expression of inner experience, abstraction, and a critical position" [13]. Expressionism is basically about using architecture to express a feeling or emotion about something that happened phenomenally [19, 13].	Characterized by Distortion of form, Stylistic expression of inner experience, and abstraction of forms [19, 13]. Inspired by natural romantic phenomena, it is organic rather than geometric. It produces an architecture of motion and emotion, ambiance, radicalism, and sweeping change [19, 13].	 fig. 5 Sydney Opera House **[20]**
Deconstructivism	Deconstructivism appeared with the revival of the Avant-grade [21]. In the year 1980, the French Philosopher Jacqes Derrida has introduced the idea of Deconstructivism [22]. It is also called structuralism, since architects depends on the structural solutions that can adopt to their designs' fragmented forms. The forms of the buildings usually don't have linear lines and/or are distorted. Deconstructivism architects does not believe that form follows function, and they believe that, this kind of architecture can go beyond current modalities of structural definition [22].	The buildings are characterized by massive volumes and distorted architectural design elements [22]. It is expressed by fragmentation, asymmetry, excesses, and radicalism of dadaism, disharmony, Mystery, disjointed angles, unbalanced appearance, and is considered un-syncopated [22, 21].	 fig. 6 Guggenheim Museum Bilbao **[23]**

Folding in Architecture	Folding techniques, or in other word origami, is a term used to describe the act of folding papers [15, 24]. In architecture, the term folding means structures consisting of 'plane polygonal elements' that are made of plates and sticks. Some designers also call it origami construction [15]– Folding techniques are currently famous in architecture, due to the ability to create creative structure that have load-carrying capabilities [15]	Wide roofing, anomalous architectural structure, abstraction in design, transformation of planes and edges, modulation, fragmentation, curvature, irregular concavity of some parts of the surfaces, and articulation of the surfaces of the volume [15]	 fig. 7 US Air Force Academy Cadet Chapel **[25]**
Neo Modernism	Neomodern architecture is quite like the modern architecture of the 20th and 21st century [14]. Neomodern architecture shares many essences of the modern style in the way it rejects classical ornamentation, and decorations. Neo-modernist buildings are designed to be large and monolithic. Neomodern architecture focuses mainly on functionality and simplicity [14].	Straight lines and squares are a must, their edges are connected, the use of angles over curves, the use of metallic and eco materials, monochromatic or vibrant looks, experiment with shapes, and are considered a functional design approach [26, 14].	 fig. 8 Barcelona Museum of Contemporary Art **[27]**

Minimalism	This architectural style is mainly concerned with removing or stripping the building from any unwanted details to show the true aesthetic quality of any given architectural element [28]. Minimalism is perceived as a new lifestyle which obviously becomes acceptable for the part of wealthy population through the eighties of the twentieth century. Its ideas in art and architecture could be understood as a new way of thinking and a new lifestyle. Architects believe that this architectural style has the capabilities of providing a 'perceptual therapy', by offering shelter from the daily life jam and presenting a relaxing space that is simple, yet elegant [29].	Characterized by having Basic shapes, monochromatic colours, simplified lines, and reduced design, flatten and clean surfaces, Spatial simplicity, conjunction with nature, transparency, soft textures, and the use of High-tech products [29].	 fig. 9 Dupli Casa **[30]**

After discussing the different types and themes of contemporary architecture, and according to the aim of the study, a focus was put on sustainable and high-tech architecture themes. In addition, a case-study analysis of three different contemporary buildings that utilized sustainability and/or high-tech themes will take place in the next part of the study.

2.2 Sustainable and High-tech Contemporary Buildings

The three case studies that are going to be analysed in this part are London Aquatic Center, Amazon Spheres, and the Centre for Sustainable Energy Technologies. The selection criteria were based on analysing different case studies with structural high-tech expressions with respect to sustainable solutions for environmental adaptation.

2.2.1 London Aquatic Center

The aquatic center is located at the Olympic Park, London, United Kingdom by Zaha Hadid Architects. The design of the building has a curvilinear roof that is inspired by the waves of the water (see fig. 10). The area of the center is 15,400 m2 (span 160 m and height 45 m). It consists of 2 floors and one basement floor that accommodates Olympic pools, a dry diving zone, a diving pool with boards and platforms, a gym, and restaurants [31]. The concept of the center is mainly resembling the fluidity of the waves of the water by merging two curved lines [32].

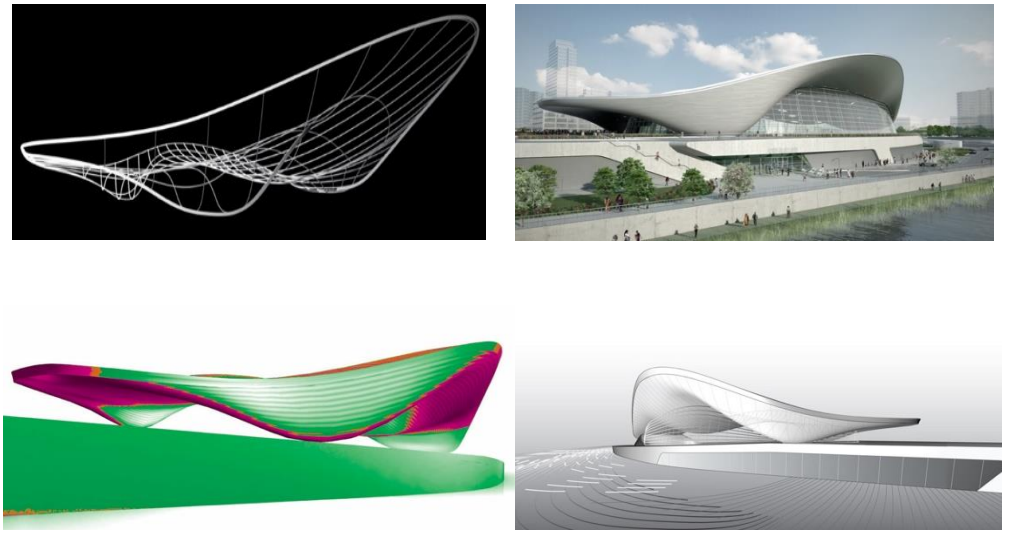

fig. 1 Fluidity and parametric design of the Aquatic Center **[33]**

2.2.1.1 Sustainable Aspects

The project also had sustainable considerations that were represented in the following: insulation and building envelope that are considered an airtight design, in addition to the use of daylighting, the use of well-insulated pool tanks, and the use of an 'adaptable environmental control system' (it works with the large volume of the hall, by using an automatic a ventilation system split into local zones). One of the main important features of the adaptable environmental control system is that it can sense the indoor air turn on and off to meet demand. Moreover, the design incorporates a rainwater harvesting system, that is used for irrigating the green areas around the building. In addition, the center was accredited by BREEAM Innovation Credit for using a low-impact concrete mix [33].

2.2.1.2 Structure System

The shell structure system of the aquatic center consists of a space frame structural system with a 'double layer grid' (see fig. 11 and 12). The space frames are supported by a reinforced concrete wall from the southern elevation, while on the northern elevations, it is supported by two huge reinforced concrete columns (span 160) (see fig. 11 and 12) [32]. The steel frames were created from lightweight steel to reduce the weight of the structure. Moreover, refined wind loads were determined through extensive use of wind tunnel testing to gather simultaneous measurements across the entire roof [33]. The structural load of the aquatic center works in tension and compression forces as seen in fig. 12. This helped in transpiring the loads from the steel trusses to the concrete piers and then to the foundation [33, 32].

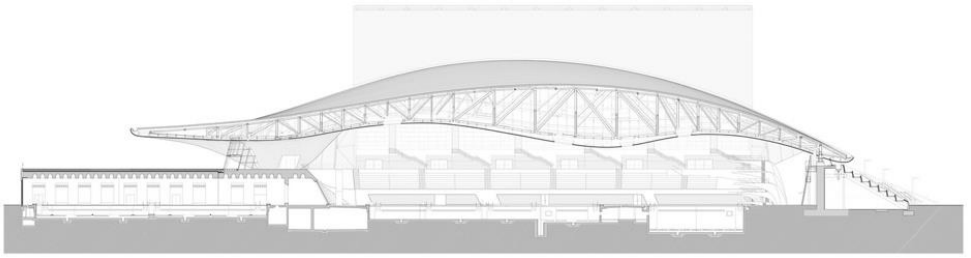

fig. 2 Section through the center, showing the structural details **[31]**

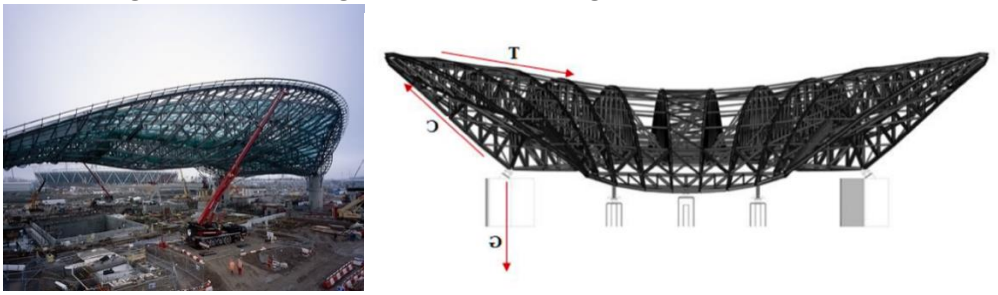

fig. 3 The structural steel frames and the transfer of the loads **[32]**

2.2.1.3 Materials

To protect the structure from corrosion, the steel frames were cladded with zinc silicate. Besides, the zinc silicate was then covered with aluminium panels. The ceiling of the interior space was covered with timber as shown in fig. 13 [32]. The design also used reinforced concrete piers and foundations. Furthermore, the exterior face of the center was covered with curtain walls to allow better natural lighting inside the building [33].

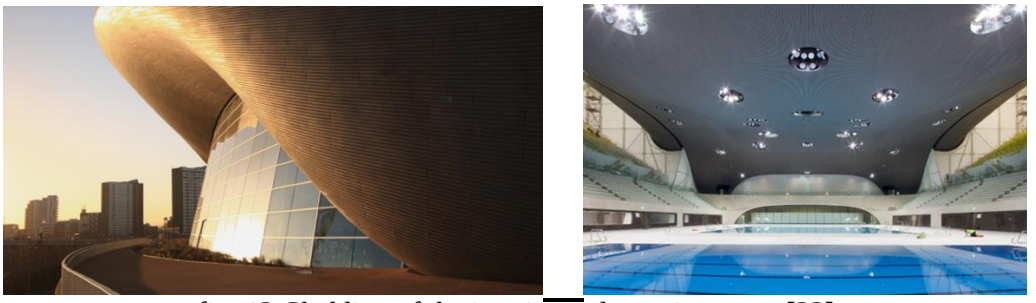

fig. 13 Cladding of the interior and exterior space **[33]**

2.2.2 The Amazon Sphere

The project was constructed in 2018 and designed by an architectural firm in Seattle, Washington, United States. The building consists of three domes that are connected to form one large room. The largest room is about 90 feet high and 130 feet wide [34].

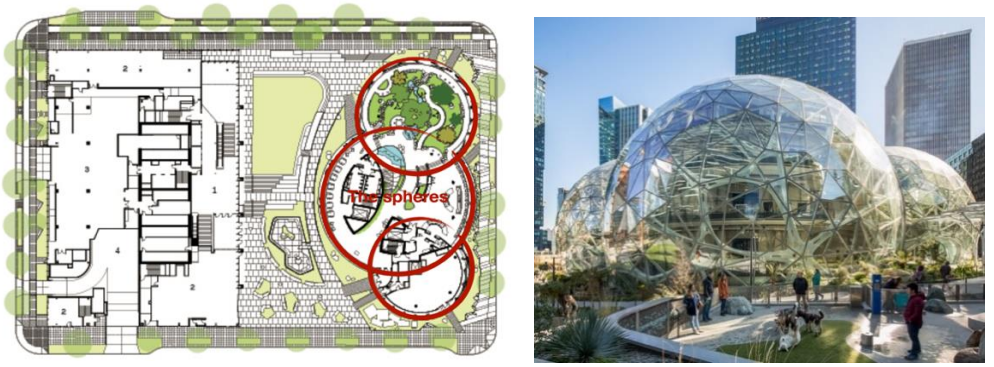

fig. 14 The Amazon Sphere **[35]**

The new headquarter of Amazon created a new design project, that doubled down the commitment to urban engagement. This was due to the creation of one building that can be considered as a neighborhood building, plaza, and open public space, which connects flawlessly with the city's existing fabric. The three glass iconic spheres consist of a multi-level concrete story, that house a botanical garden filled with 40,000 plants taken from different countries across the world [35, 36]. These multi-levels can be accessed by workers of the amazon headquarters, where they can "get away from the city", without leaving the neighborhood as seen in fig. (16) [37]. Below the spheres, lies an understory space that can be accessed by the public, thus allowing the public to enjoy the biophilic effect of the gigantic design (see fig. 15) [36].

Fig. 15 Inside the Spheres and the biophilic design **[38]**

2.2.2.1 Vision

The design is primarily envisioned as an innovative working space that can be used by Amazon staff. The 'biospheres' consists of steel frames cell's structure system, that supports around 2500 glass panels. The idea of a workspace that is surrounded by generates and forest-like environment evolved from the idea of embracing biophilia (see fig. 15), which is based on the integration of nature into the built environment. The forest-

like spheres are the home of around 40,000 plants, and they reflect the city's 'combined technical prowess' and relationship to nature [36, 37].

fig. 16 Catalan inspiration **[38]**

fig. 17 Section through the Spheres **[35]**

The design of the spheres and their structure system was mainly inspired by a lamb design (as seen in fig. 16). The spheres' shape is composed of 60 pentagon shapes named Catalan or pentagonal hexecontahedron, which are equal in size and shape (see fig. 18). These Catalans were designed using a parametric software named MKA, that allowed the architects to create an infinite number of possible designs [37].

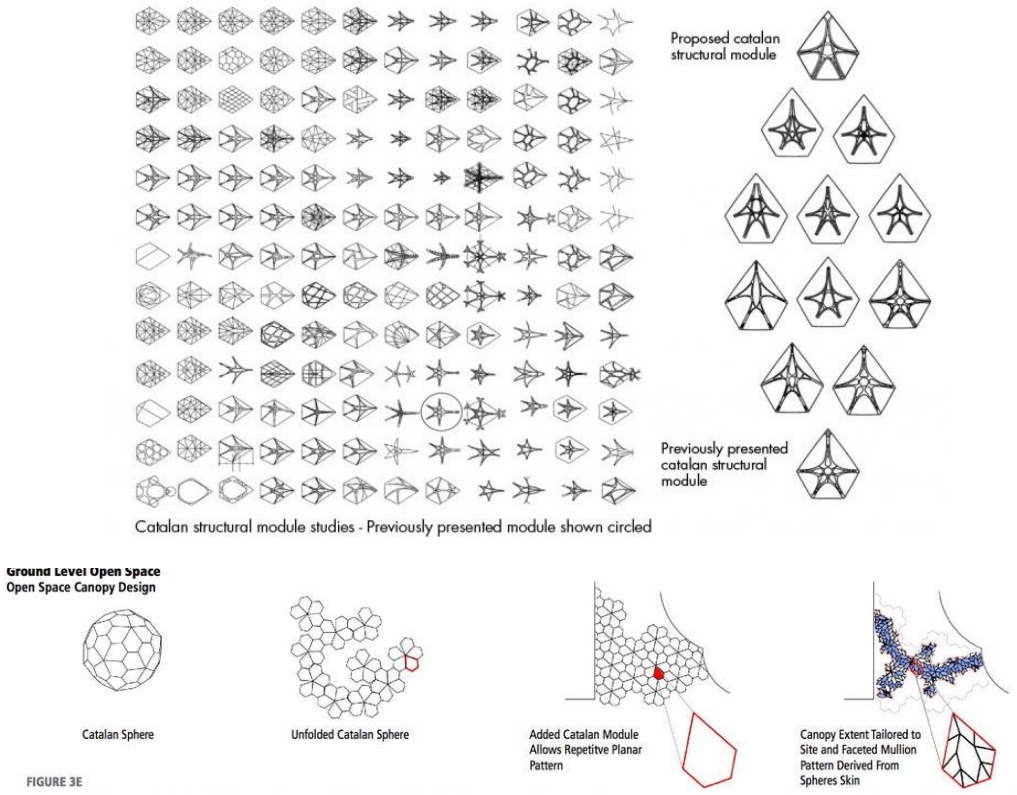

fig. 18 Catalan Unit formation **[38]**

The design was also intended to allow the maximum amount of solar access inside the building for the plants to survive, and at the same time limit heat solar gain for human comfort [37, 35]. Therefore, the team chose a 'low-iron glass composition' with a 'low-e-coating', which allowed limited heat gain and maximum solar access [37].

2.2.2.2 Structure Design

Generally, the 65,000-square-foot space consists of more than 620 tons of steel supported by ring beams that are supported on a concrete base to support the 'triangular double-laminated insulated glass units' (The 2,643 glass panes) (see fig. 22). The structure design of the spheres is mainly divided into two different structures; an outer frame and an interior concrete structure of the slabs (see fig. 19) [39, 34]. The interior and exterior structures are supported on 12 million pounds of concrete reinforced by 2.5 million pounds of rebar. The Catalan steel structure and the supports of the glass façade transfer the loads to a 400,000-pound ring beam, which then transfers the load to columns in the floors below [37].

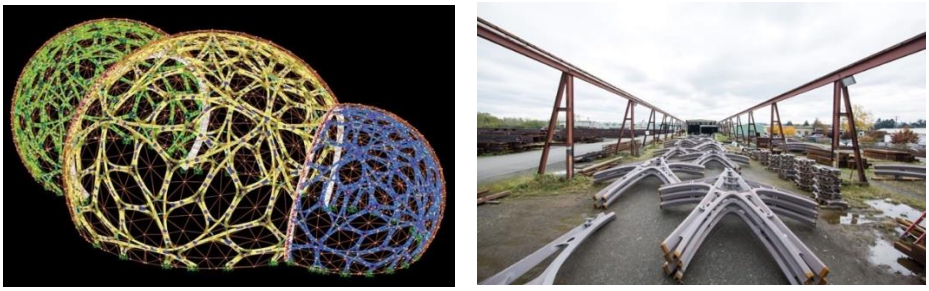

fig. 19 Catalan Parametric steel structure **[37]**

The shell of the three spheres consists of modules of 180 elongated pentagon modular units; then, each edge of the modules is connected to a centralized hub. By connecting all of them together, the architects were able to create a fluid-like 'modular pattern' that was repeated throughout the building (see fig. 21). The steel parts of the modular units were prefabricated and assembled on site like a puzzle (see fig. 19 & 21) [37].

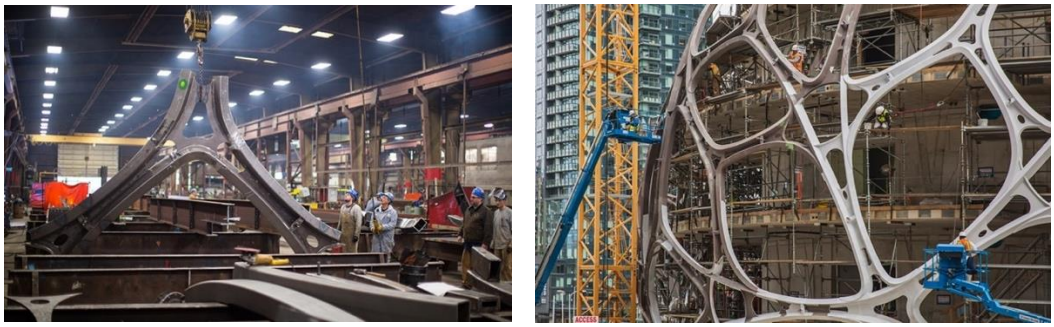

fig. 20 Fabrication and installation of the Catalan steel structure **[34]**

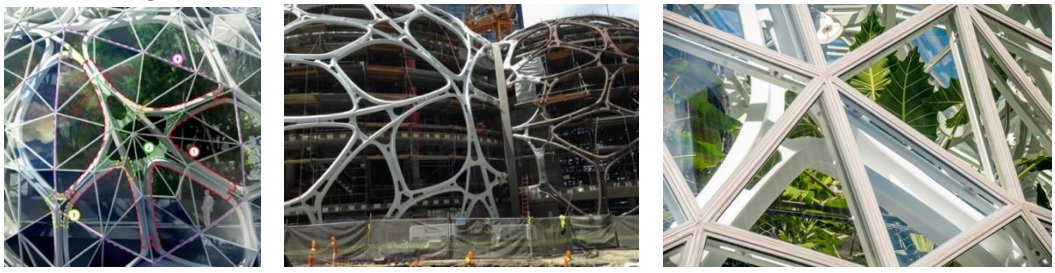

fig. 21 Steel structure details **[37]**

2.2.2.3 Steel Coating

The interior space of the spheres is considered a tropical rainforest environment, where the temperature can reach 72 degrees Fahrenheit with 60 percent humidity; while, at night the temperature may drop down to 55 degrees with 85 percent humidity. These fluctuations in the temperatures and humidity create a 'copious condensation' effect that

can cause corrosion. To overcome this obstacle, the steel frame's structure was coated with 'Tnemec's Fluoronar', a 'FEVE-based' fluoropolymer (see fig. 22) [37, 34].

fig. 22 Materials of the sphere **[37]**

2.2.3 Center for Sustainable Energy Technologies

The project is in Ningbo, China and it was built in 2008. It is one of the campuses of the University of Nottingham and it was designed by MCA. The building is 13993 square feet, and it consists of research laboratories and classrooms for courses [40].

The pavilion was inspired by the paper lanterns and fan-shaped of The Chinese tradition. The façade of the pavilion is composed of double-skin glass and screen-printing patterns, inspired by the historical buildings in the area and it folds drastically to create a dynamic effect [41].

The design of the building accommodates different environmental strategies. It contains a large opening at the rooftop, which allows natural light to illuminate the building's floors, in addition to providing good natural ventilation. Moreover, the building also has an underfloor heating panel that can heat and cool the environment using a 'geothermal energy' [41].

fig. 23 Center for Sustainable Energy Technologies **[42]**

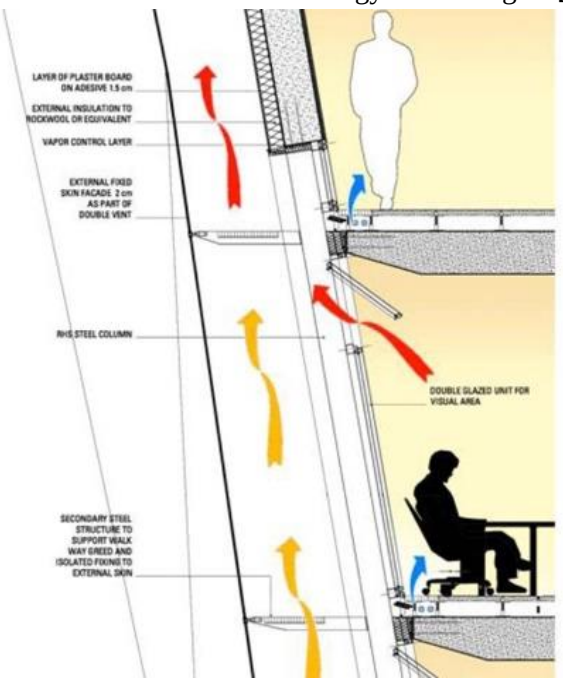

fig. 24 Heating and cooling effect of the double skin facade **[42]**

One of the most innovative features of the building is that it adapts to seasonal changes. This was achieved by applying five main strategies, which include, using the building envelope for insulation, generating the thermal capacity from the volume, controlling, and making use of the sunlight, and creating good natural ventilation for the different spaces of the building. Generally, the building has a low impact on the environment, due to the use of local materials, rainwater harvesting, and greywater reuse [41].

Additionally, the energy consumption of the building is very low (reduced by 75%), due to the stability of the indoor climate and the incorporation of natural lighting that limited the need for artificial lighting. Besides, the energy used for artificial lighting and water cooling comes from photophilic panels installed on-site. Moreover, the roof of the building contains wind turbines for experimental and demonstrational purposes [42]. Also, the green areas surrounding the building and the green roof provide a reduction for the urban heat island effect by acting as an autonomous ecosystem (see fig. 25) [41].

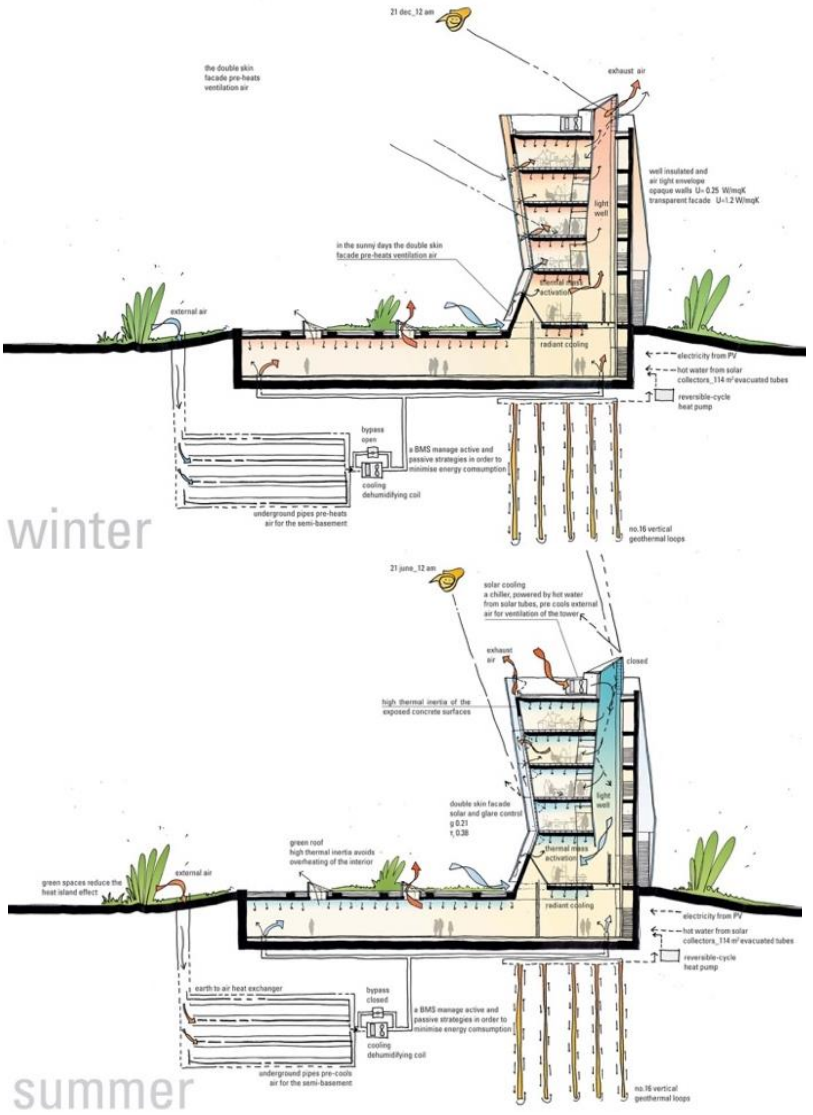

fig. 25 Seasonal adaption to environmental conditions **[42]**

The building has double skin on all sides to create a building envelope (concrete and glass skin). This envelope along with the thermal capacity of the concrete preserves the inside cool. Besides, the atrium over the full height of the building aids in the natural ventilation of the building by allowing the cool air to enter the building, while the hot air escapes the building from the double skin glass. For an extra cooling effect, an absorption refrigerator and an air conditioning unit on the roof dehumidify and mechanically cool the air for the tower. During a cold spell, the heating works in a similar fashion (see fig. 25) [42, 41].

3. Discussion

The study focused on investigating pluralism in the sustainability and high-tech themes of contemporary architecture through the qualitative comparative analysis of three different buildings that adopted these two themes, according to the findings of the analytical study, as seen in table 2, the following was deducted:

The aquatic center was mainly considered a high-tech contemporary architectural style, due to the use of advanced construction techniques, the use of parametric design, the design of large interior spaces, the use of prefabricated materials, and the extensive use of glass. However, influences from other themes are still present. This was clear in the integration of sustainable features (sustainability theme) and the high degree of minimalism, which was clear in the use of monochromatic colours, simplified lines, simple and reduced design, soft textures, and transparency in the use of curtain-walls. In addition, there is a clear influence from the expressionism theme in the abstraction of forms, the inspiration from nature (the wave of the water), and that it's an organic form.

Moreover, for the second case study (Amazon Spheres), according to the details of the design of the spheres, the influence of the High-tech theme was clarified. Most of the characteristics of the theme were reflected by the expressed structure of the Catalan steel frame, the use of prefabricated modular units, the use of glass facades, and the large interior spaces. However, as was previously explained, contemporary architecture is an architecture of pluralism. Therefore, the integration of the sustainability theme within the building was present through the creation of a botanical-like garden within the building, which created a biophilic effect and provided the workers and the city with a unique green experience. In addition to the minimalistic influence in the design of the building in using the basic shapes (sphere) as the main design form, the spatial simplicity, the transparency, and the conjunction with nature.

In the third case study despite following the sustainability approach, the design was also influenced by minimalism, expressionism, and deconstruction themes. The minimalistic theme was well-defined in the use of simple and reduced design and the use of transparency. Expressionism was reflected by the distortion of form, and the abstraction of forms. Moreover, the asymmetry of the form expressed deconstructivism in design, as well as using the disjointed angles of the exterior façade and the unbalanced appearance.

Table 2. Analyzing the Case studies using the matrix of the different characteristics of the different themes (Source: author)

Themes	Characteristics	Aquatic Center	Amazon Spheres	Centre for Sustainable Energy Technologies
Post-Modern	Bright colours	◉	◉	◉
	Playfulness			
	Classical motifs			
	Variety of materials and shapes			◉
High-tech Architecture	Smooth & impermeable skin	◉	◉	◉
	Use of glass	◉	◉	◉
	Large and flexible interiors	◉	◉	
	Expressed construction	◉	◉	
	Coloured pipework and service			
	The use of prefabricated elements	◉	◉	◉
	Glass walls and steel frames	◉	◉	◉
	Lightweight construction	◉	◉	
Sustainability	Bright colours	◉	◉	◉
	Sustainable site design		◉	◉
	Water conservation and quality	◉		◉
	Energy and Environmental considerations	◉		◉
	Indoor environmental quality	◉	◉	◉
	Conservation of materials and resources	◉	◉	◉
Expressionism	Distortion of form			◉
	Stylistic expression of inner experience	◉	◉	
	Abstraction of forms	◉		◉
	Inspired by natural romantic phenomena			◉
	sweeping change			
	radicalism			
	ambiance			
	produce an architecture of motion and emotion	◉		◉
	Organic rather than the geometric	◉		
Deconstructivism	Massive volumes	◉	◉	
	distorted architectural design elements			◉
	Fragmentation			◉
	Asymmetry			◉
	radicalism			
	Disharmony			

Folding in Architecture	Disjointed angles			◉
	Unbalanced appearance			◉
	Un-syncopated			
	Mystery			
	Wide roofing			
	Anomalous architectural structure			
	Abstraction in design transformation of planes and edges			◉
	Modulation		◉	
	Fragmentation			◉
	Curvature	◉		
	Irregular concavity of some parts of the surface			
	Articulation of the surfaces of the volume			
Neo-Modernism	Straight lines and squares are a must			◉
	Connected edges			
	Angles over curves			◉
	Use metallic and eco materials	◉		◉
	Monochrome or vibrant	◉	◉	◉
	Experiment with shapes			
	Functional design		◉	◉
	Basic shapes	◉	◉	
	High-tech products		◉	◉
Minimalism	soft textures	◉		
	transparency	◉	◉	◉
	Conjunction with nature		◉	◉
	Spatial simplicity			
	Flatten and clean surfaces			
	Monochromatic colours	◉		
	Simplified lines and reduced design			◉

4. Conclusion

This study was set out to explore the plurality impact of contemporary architecture. The study has also sought to define contemporary architecture, the characteristics of contemporary architecture, and the different themes of contemporary architecture. The study focused on investigating pluralism in the sustainability and high-tech themes of contemporary architecture through the utilization and analysis of three different buildings that adopted these two themes. However, by analyzing and comparing the three buildings using the different characteristics of the different themes of contemporary architecture, one may find that pluralism is found in all of them

Finally, Contemporary architecture is known for different themes, and they are Influenced by each other and can be derived and complement each other through the design process and according to the architects' visions. The research findings indicated that pluralism in architecture is highly present in contemporary architecture, toward coping with community changes. During the timeframe of this research, certain limitations were found that highlight opportunities for future studies. More case studies could be analyzed to confirm the findings of this study, and a comparison between the findings of this study could be compared with the findings of other studies that can tackle more themes of contemporary architecture. In addition, experts' interviews could be done to confirm the findings of the study.

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