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# Groundbreaking Moments in Architecture – The 20<sup>th</sup> C and Beyond .4 CEU

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## Beverly Vosko

# Groundbreaking Moments in Architecture – The 20<sup>th</sup> C and Beyond .3 CEU Handouts

## Welcome to our seminar!

What do New York skyscrapers, Fallingwater in Mill Run Pennsylvania and the Guggenheim Museum in Bilbao Spain have in common?

They all represent groundbreaking moments in architecture: technical achievements using new materials which took architecture in a new direction. Building work was dominated by wood and stone until the 18<sup>th</sup> Century but the vocabulary of architecture broadened tremendously in the last 200 years with the advent of the use of concrete, glass and metals particularly steel - and architect's philosophy changed dramatically as well.

### I. First Function, Then Form

- a. In the 20<sup>th</sup> C, the notion that architectural form can develop from the inner function of a building became popular and modern building's exteriors became adorned with visible recognizable structural elements thus letting their function express itself.
- b. The prototype of functionalist architecture was the Bauhaus. Its directors Walter Gropius and Mies Van Der Rohe built structures made of reinforced concrete ( which was concrete mixed with steel) with flat roofs, many glass windows and exterior facades completely devoid of any ornamentation whatsoever.
- c. Another prominent architect with a similar style was Le Corbusier who recommended 5 points of architecture for his structures:  
To lift them off the ground and support them on reinforced concrete stilts, to give them a free facade, an open floor plan  
Long strips of windows and roof gardens –ideas still popular today
- d. This style, which crossed national barriers, became known as the “International Style” and was characterized by the use of reinforced concrete with large wide windows, uninterrupted interior spaces, simple lines, and strict geometric forms.

### II. Functionalists With Twists

- a. Finn Alvar Alto incorporated wood into his functional architectural designs because wood has historically been an important component in Finnish architecture and because he thought it was warmer than metal.
- b. American architect Frank Lloyd Wright was another functionalist who adapted functionalism to suit his personal ideology utilizing a combination of natural materials and abstract geometric designs and

eventually created an organic architectural style that blended seamlessly into his landscape

1. A created what he called the “Prairie Style” which is typified by low profile homes with strong horizontal lines, flat unadorned walls, flat roofs, long bands of large windows & wide sheltering overhangs
2. The main difference between Wright and most of the other functionalists is that, like Alto, he also used wood vs reinforced concrete and he used it even more extensively as one can see in the Isabel Roberts House and Fredrick C. Robie House

### III. Sculpture in Architecture

- a. Though there was always a connection between the 2 genres, there were clearly defined boundaries between sculpture and architecture until the 20<sup>th</sup> Century when Architects began to shape their buildings the way sculptures had crafted their sculptures
- b. These organic sculptural buildings were all made using reinforced concrete
- c. Le Corbusier took advantage of the possibilities that curved concrete had to offer and became more organic and sculptural as exemplified by his Chapel of Notre Dame Du Haut, in Ronchamp France which he completed in 1954
- d. Japanese architect Kenzo Tange was influenced from an early age by Le Corbusier and built Yamanashi Press and Broadcasting Center in Yamanashi Japan to look like a concrete castle
- e. Brazilian architect Oscar Niemeyer (1907-?) also combined sculpture and architecture using undulating curves in his Casa do Baile in Pampulha, Brazil which he built in 1943 and creating the National Congress Building in Brasilia, Brazil with 2 large curved bowls on the building’s rooftop
- f. Frank Lloyd Wright’s work became more organic and sculptural as he aged
  1. The residence Fallingwater in Mill Run PA was very organic. It is made of reinforced concrete with large bands of windows and it sits cantilevered over a waterfall on a hill, totally integrated into the surrounding landscape in harmony with its natural environment
  2. His Guggenheim Museum in NYC, which was an inverted ziggurat ( which is a stepped, winding pyramidal Babylonian temple) was his “piece de resistance” of sculptural design, where he attempted to render the inherent plasticity of organic forms in architecture
- g. Finnish architect Eero Saarinen (1910-1961) created sculptural buildings that also expressed their own function as exemplified by the

TWA terminal at New York's J.F. Kennedy airport which he built in 1962 to resemble the wings of a bird about to take flight

- h. Danish architect Jorn Utzon built Sydney Opera House (1973), which sits in Sydney harbor, with 12 huge sculptural white concrete sail-like shapes to resemble a boat sitting in the harbor
- i. Spanish Santiago Calatrava is both an architect and an engineer, who is renown for his bridges as well as his sculptural buildings and is famous for creating reinforced concrete sculptural forms that resemble living organisms. Some examples of his work are:
  - 1. The sculptural Auditorio de Tenerife in the Canary Islands
  - 2. TGV Rail Station in Lyon France that resembles a giant bird with a glass body and a concrete beak pointing to the ground
  - 3. Trade Center Transportation Hub, the home of the PATH trains, that connect occupants of New Jersey with Manhattan, in 2016. which on the exterior looks like a bird in flight, and has "wings" that actually move
  - 4. The Greenwich Peninsula/Peninsula Place off the River Thames in southeast London (2017) is approx. 1,400,000-square feet and hosts a new tube station, performance venue and winter gardens topped by a sculptural crown-like arrangement of towers

#### IV. Glass Houses

- a. In the early 1920s, glass was combined with thin iron metal and glass buildings became a major theme among the architectural avant-garde because the combination of large scale glass production which enabled glass to be used as a buildings external skin and the use of thin iron metal vs stone as a building's structural support, enabled transparent spaces to emerge
- b. Bruno Taut built one of the 1<sup>st</sup> glass structures at the Glass Exhibition Pavilions created for the German Werkbund Exhibition of 1914 in Cologne, Germany. Only the base was made of concrete, the rest of the structure was glass topped by a dome of multicolored glass plates
- c. One of the most famous glass houses was built by Philip Johnson in New Canaan Connecticut in 1949 who apparently was greatly influenced by Mies van der Rohe's model for the glass Farnsworth House that he saw
  - 1. In Johnson's Glass House, the kitchen, dining and sleeping areas are all in one open, glass-enclosed interior space which is divided by low walnut cabinets
  - 2. Inside a brick cylinder containing the bathroom which extends slightly above the flat roof of the building is the only non-glass element in the house

3. Johnson initially lived in his glass house but eventually lived in a brick guest house that he built on the property and used his Glass House for entertaining

#### V. Building With Light

- a. The nighttime cityscape only changed at the end of the 19<sup>th</sup> C after Thomas Edison invented the electric incandescent light bulb on December 31, 1879. He said: "We will make electricity so cheap that only the rich will burn candles", and his words have proven true
- b. Electrification, caused life to extend further and further into the evening both outside where streetlights allowed passersby to gaze into shop windows long past twilight and inside where illuminated interiors allowed inhabitants to enjoy those spaces into the wee hours of the night
  1. One of the 1<sup>st</sup> structures to utilize artificial lighting throughout the tower structure and light up the Paris skyline at night was The Eiffel Tower built by Gustave Eiffel and finished in 1889
  2. Glass structures lent themselves to electrification. Bruno Taut utilized artificial lighting to highlight his Glass Pavillion at the German Werkbond Exhibition of 1914.
  3. Mies van der Rohe utilized artificial lighting to highlight both his Barcelona Pavillion at the Barcelona World's Fair and his Farnsworth House, the Glass House he built in 1951
  4. Architect Jean Nouvel built the 38 story Torre Agbar in Barcelona with 4500 LED lights on its façade which can be switched on separately glowing blue, red, pink or yellow and with independent color transitions, enable Barcelona's highrise tower to shimmer in 16,000,000 colors all night long

#### VI. Architecture That Scrapes the Sky

- a. 20<sup>th</sup> Century architecture and city skylines are almost inconceivable without high rise buildings, yet they only appeared at the end of the 19<sup>th</sup> Century
- b. the first high rise buildings came nowhere near the sky – they were no more than six or seven stories high because they had to be accessed via stairs which set height limits for those buildings until Elisha Otis invented the elevator which vertically transported people without them having to climb up stairs and instantly, buildings began to rise higher
- c. Today, the Burj Khalifa building in Dubai set a new record by being over 2625 feet high
- d. Highrise buildings started in Chicago when things had to be rebuilt after the great Chicago fire and William LeBaron Jenney's used innovative steel girders to support the ceilings and exterior walls of his 180 ft high Home

Insurance Building vs all stone masonry reducing the building wall thickness, enlarging the building's interior space and enabling a greater expanse of windows

- e. Louis Sullivan who coined the famous phrase "form follows function" also believed that buildings "must be tall" and built several of the 1<sup>st</sup> tall skyscrapers
- f. The showplace for skyscrapers soon became New York City where the 1<sup>st</sup> skyscraper, the Fuller Building in Manhattan's midtown, was built just after the turn of the Century by architect Daniel H. Burnham
- g. The Chrysler Building, built in 1928 to be 77 stories and 1050 ft tall, was the 1<sup>st</sup> skyscraper to ever exceed 1000 feet and the tallest building in the world at the time it was built
- h. In 1931, the Empire State Building was built to be 102-stories with a roof height of 1,250 ft, and including its antenna stands a total of 1,454 ft tall. It replaced the Chrysler Building as the tallest building in the world and stood as the world's tallest building for nearly 40 years, until the World Trade Center's North Tower was built in late 1970

#### VII. Post WW II New York Skyscrapers – Glass and Steel

- a. The economic crash of 1929 temporarily ended the architectural push upwards, but when people started building skyscrapers again, they used a new form of steel construction which enabled the structural skeleton to be reduced to a minimum so Post W W II skyscrapers flaunted totally glass façades
- b. The Seagram Building, built in 1958 by Ludwig Mies van der Rohe and Philip Johnson is among the 1<sup>st</sup> of this generation of all glass buildings. Mies, the functionalist, was convinced that the structural skeleton of a building should remain visible – but he couldn't have his structural skeleton on view due to building code, so he placed non-functional bronze toned I-beams on the building's exterior facade which visually suggested the building's structure
- c. Pirelli Tower is a 32 story, 407 ft skyscraper built by Gio Ponti in Milan Italy in 1958. Characterized by a minimalist structural skeleton, curtain wall façades and tapered sides, it was among the first skyscrapers to abandon the customary block form for a more streamlined shape

#### VIII. High Tech Architecture

- a. The High Tech architects of the 1970s took Mies van der Rohe's concept of visually presenting a building's structure on its external façade one step further, turning their buildings "inside out" to display their entire infrastructure on the building's external façade

- b. In order to do this structural engineers must play a large a part in the buildings design
- c. Today's High Tech designs are characterized above all by lots of metal and glass: they are typically glass facades chosen for their transparency and visual lightness juxtaposed against metal ribbing
- d. The Hong Kong and Shanghai Bank, is a 590 ft High Tech building designed by British architect Norman Foster and structural engineers Ove Arup. It was completed in 1986 and is to date the most expensive building in the world, with building costs of 5 billion dollars. All its infrastructure is displayed on its exterior facade
- e. The Georges Pompidou Center in Paris France is the epitome of the High Tech style, with a color coded infrastructure displayed on its exterior facade: the round water pipes are green, the round air conditioning ducts are blue, the electricity is yellow, the elevators and escalators are red and the bays and passageways are gray
- f. Renzo Piano built the Menil Art Museum, in Houston TX in 1986 to be High Tech but blend in with its surrounding neighborhood

#### IX. Deconstructivism in Architecture

- a. Deconstructivist architecture is characterized by an absence of harmony, continuity or symmetry using surface manipulation, fragmentation, non-rectilinear shapes and a wide palette of building materials which distort and dislocate architectural conventions concerning structure and envelope
- b. One of the main proponents of the Deconstructivist movement is Canadian architect Frank Gehry.
  - 1. Gehry's Guggenheim Museum in Bilbao, Spain is completely unhindered by traditional rules that regulate architectural design.
    - a. Gehry designed this museum on a computer to have moving curvilinear forms reminiscent of an opening flower and uses the unconventional material, titanium combined with glass and limestone as its exterior cladding
    - b. The small titanium singles that sheath the building exterior, are light, tough, flexible and unlike steel or aluminum, don't corrode. They shimmer in the sunlight and change colors according to the light conditions, reflecting the changing colors in the atmosphere and emphasizing the building's deconstructivist origins
  - 2. Gehry's Vitra Design Museum in Weil am Rhein, Germany, is another deconstructivist building which has asymmetrically integrated forms
    - a. It is a whitewashed building with shining silver roofs, made up of a collage of tilting towers, ramps, cubes and winding staircases which are piled one on top of the other in a way which appears random but

is actually determined by the function of the spaces and the direction that light enters them

3. The Dancing House“ in Prague designed by Frank O. Gehry and Vlado Milunic was built to be a Deconstructivist icon
  - a. It is meant to symbolize Ginger Rogers and Fred Astair dancing together and is constructed using 99 concrete panels each of different shape and dimension, each therefore requiring a unique wooden form
4. The Museum of Pop Culture, or MoPOP in Seattle, created by Microsoft co-founder Paul Allen and designed by Gehry in 2000 is another great example of Deconstructivist Architecture
  - a. Gehry designed it as a tribute to the musician Jimi Hendrix. The complex as a whole is a fragmented undulating building which looks like a smashed electric Fender Stratocaster guitar that Hendrix used to play and destroy after each concert
  - b. Its outside features a fusion of textures and colors, including gold, silver, deep red, blue and a "shimmering purple haze.
  - c. It has a rippling titanium sheet-metal exterior cladding which changes color depending upon the light and resembles Gehry's Guggenheim Museum in Bilbao

c. Swiss architect Bernard Tschumi took the Modernist credo “form follows function” and created his own motto “form follows fantasy

1. We designed Parc de la Villette which was a master plan for landscaped gardens in the northeast corner of Paris which was completed between 1982-1998
  - 2, Park de La Villette is a 125 acre park which has a series of 26 bright red structures or follies in it. One red structure is a welcome center for visitors, some are restaurants, others are promenades, covered walkways and bridges while others are mere fragments of buildings whose function remains a mystery These red structures are eye catching because their color is complementary to and contrasts with their green surroundings
- d. Peter Eisenman chose to translate the complex ideas of philosophical deconstructivism into “instability in architecture”
1. Ohio State Wexner Center for the Visual Arts which he completed in 1989 does not appear to be stable; a white metal scaffolding with no apparent purpose sways between brick towers which look as though they have been sliced in half
- e. Daniel Libeskind's (1946-?) Jewish Museum in Berlin, is another avant-garde Deconstructionist building with its asymmetrically slanted titanium walls, underground axes, empty rooms called “Voids” that have no way out, diagonally shaped slit strip windows, asymmetrical stories and dead ends



## Bibliography

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## Biography

Beverly Vosko, Allied Member ASID, RID, UDCP (Universal Design Certified Professional), CAPS, L.E.E.D Green Associate, CGP (is a full service, Registered Interior Designer in Texas #6333. She is President and founder of both Beverly Vosko Interiors and InteriorDesign-ED; both DBA's for C. V. Design Inc. For over 25 years, she has been designing homes across the United States and Europe, specializing in creating custom residential and commercial environments, be they traditional, transitional, contemporary or eclectic, that match her design clients' every need, through her design firm, Beverly Vosko Interiors. For nearly 20 years, she has taught Interior Design: first at Rice University, then at the University of Houston, and for the last 10 years nationally, with her Continuing Education company, InteriorDesign-ED. Specifically, she has taught Interior Design, Aging in Place, Green/Sustainable Design, Lighting and Antiques. She graduated Phi Beta Kappa, Magna Cum Laude from the University of Pennsylvania, studied Art History at Harvard University, and received her MBA in Marketing from NYU Stern Graduate Business School, and completed Design and Antiques training from Sotheby's, the world-renowned Inchbald School of Design and Houston Community College. Please view her websites, [www.vosko.com](http://www.vosko.com) and [www.InteriorDesign-ED.com](http://www.InteriorDesign-ED.com)