Frank Lloyd Wright

"Continuity in the whole"

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Irene Guggenheim, Wassily Kandinskij, Hilla Rebay and Solomon Guggenheim, 1930 ca.

The history of the **Guggenheim Museum** began in **1926 when Solomon Guggenheim**, a man of vast wealth made in mining and minerals, fell under the influence of **Hilla Rebay,** a thirty-six-years old painter and enthusiast of twentieth-century European abstract art. During the following decade, Guggenheim collected avidly and in 1937 established the Solomon R. Guggenheim Foundation, an institution by which his collection was made available to the public. Beginning in 1939, the collection of 700 paintings was exhibited at the Museum of Non-Objective Painting at 24 East Fifty-fourth Street. In **June 1943**, Hilla Rebay, who had become the curator of the collection, approached **Frank Lloyd Wright** about the design of a museum for the collection.

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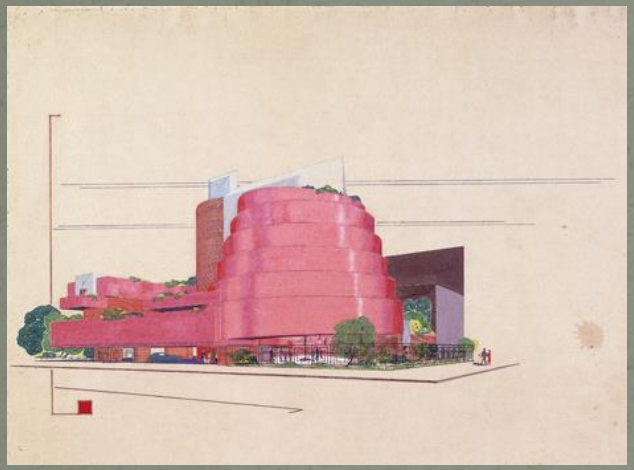

The **spiral solution** seems to have occurred to him sometime late in 1943. The northern half of the present site on Fifth Avenue at Eighty-ninth Street was purchased in March 1944, and on 27 July 1944 Solomon Guggenheim accepted Wright's sketches for a spiral-formed building and authorized him to proceed with detailed drawings.

Though Wright's first sketches depict a spiral building with a wide base, he soon flips the structure so that it grows progressively wider as it travels upward.
He wrote to Rebay "I find that **the ziggurat** has great possibilities for our building...We can use it either top side down or down side top".

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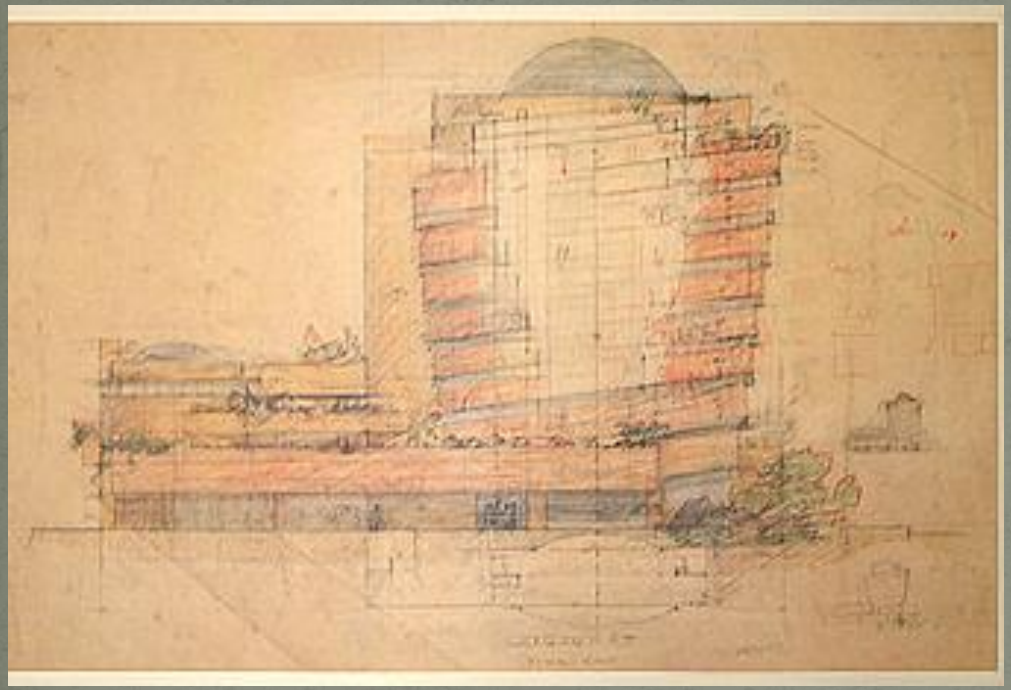
In the photograph Wright, Hilla Rebay and Solomon Guggenheim

At the unveiling of the museum model held at Plaza Hotel in New York **(September 1945)** , Wright takes the opportunity to explain that the museum's form has been inspired by **ancient ziggurats**, but that he has turned the shape upside down to express **expansive possibility**: the spiral could theoretically go on infinitely toward the sky.

Frank Lloyd Wright "Continuity in the whole"



As is well known . both semantically and formally in a key design study for the Guggenheim, Wright noted the relationship between the museum's form and the ancient morphology. In it, we see the words **"ziggurat", "zikkurat" and "taruggitz".** With the Guggenheim museum Wright chose and transformed the ancient ziggurat, a form that one begins to see in some of his earlier works, such as the **Gordon strong Automobile Objective and Planetariium (1924-25) at Sugarloaf** , Maryland.

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Spiral formed buildings in history includes the Tower of Babel, the Minaret of the Great Mosque of Samarra and Borromini's spire at Sant'Ivo alla sapienza in Rome.

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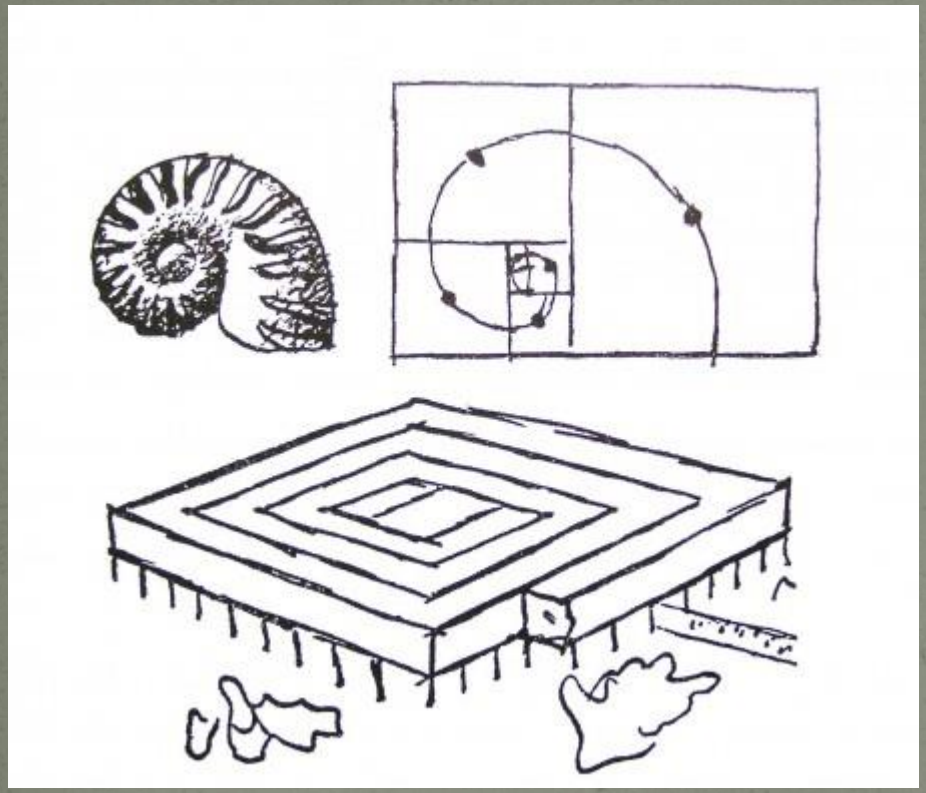

Le Corbusier The Museum of Unlimited Growth , 1939.

Le Corbusier produced his first design for **a museum of contemporary art** in response to a call by the art critic and publisher Christian Zervos. He laid out the idea of a modular structural system composed of "structural posts, fixed or movable partition-membranes and standardized ceilings" that could be put up singly or in groups. The museum was to grow **in a spiral** around a space 14 meters square. He had previously employed the spiral form in his 1928-29 design for a Historical Museum as the centerpiece of Mundaneum.

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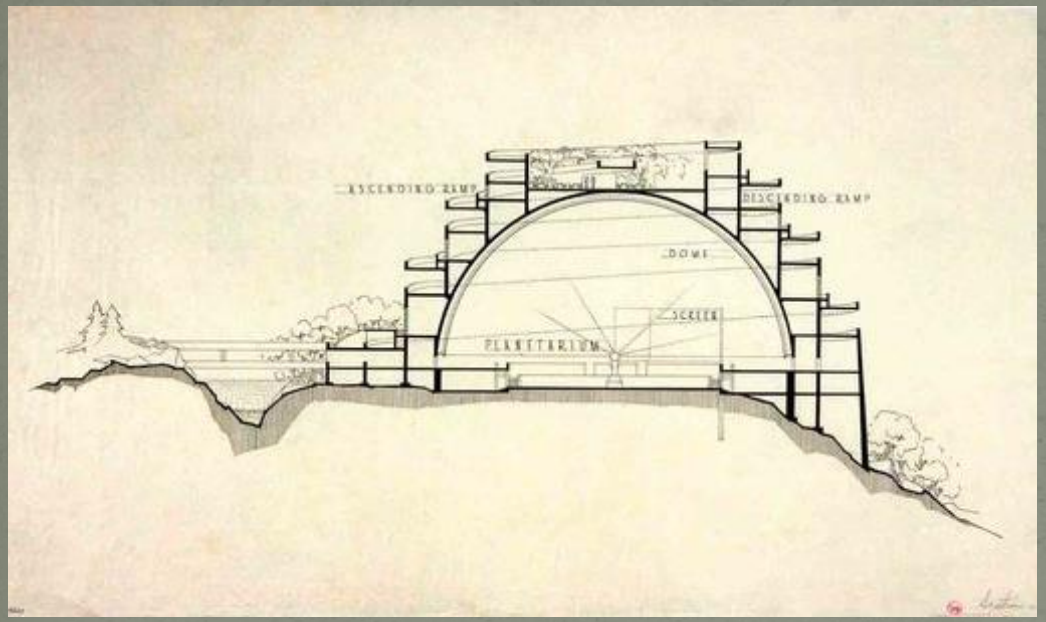
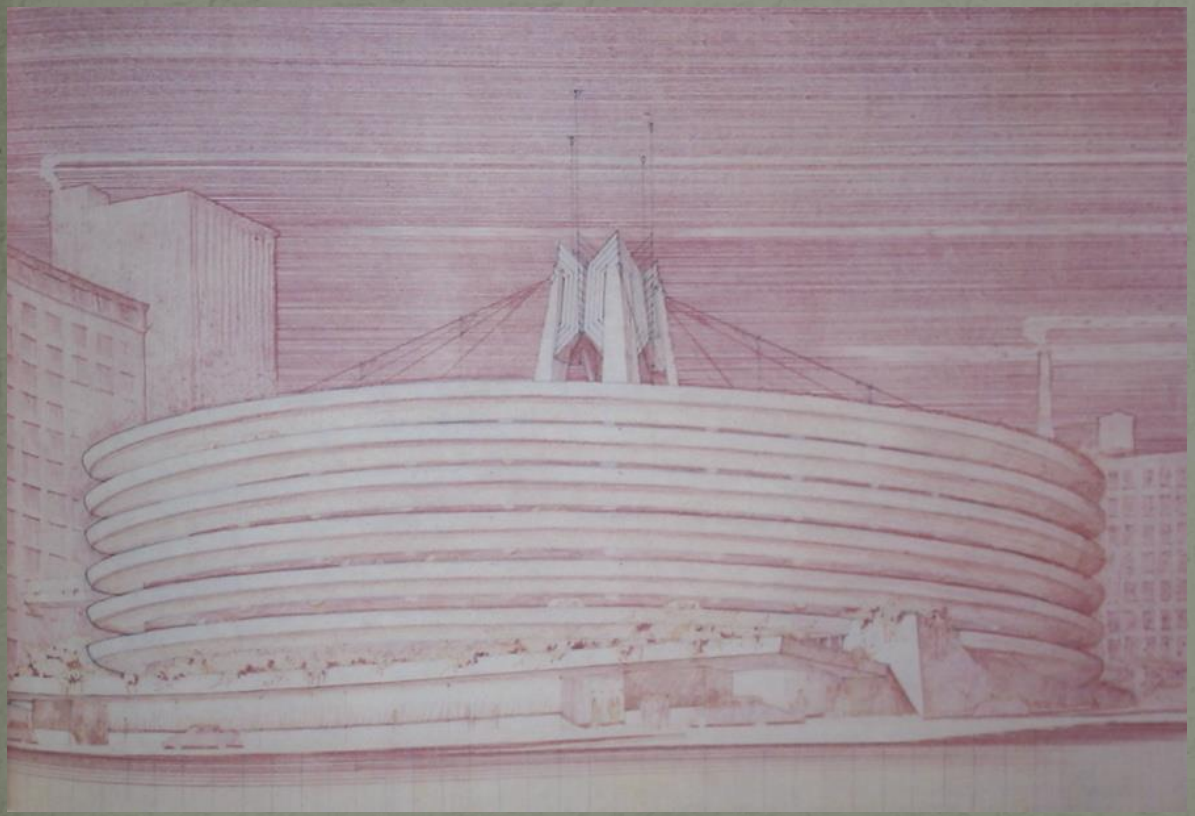
It was during the early 1920s that Wright attempted his first spiral formed building, the **Gordon Strong Automobile Objective for Sugarloaf Mountain**, Maryland, of 1924. Though never realized, the Strong commission is noteworthy because it is the first of the spiral-formed buildings designed by Wright between 1922 and the 1950s, a series that would culminate with the Guggenheim.

Frank Lloyd Wright "Continuity in the whole"



Both Strong and Wright viewed the project as historically inspired by the squared, stepped pyramid at Saqqara and the ziggurats of ancient Assyria and Babylonia.
Wright took the idea of a double – spiral automobile ramp from the urban parking garages a new building type where the **ramps** are the most important element.

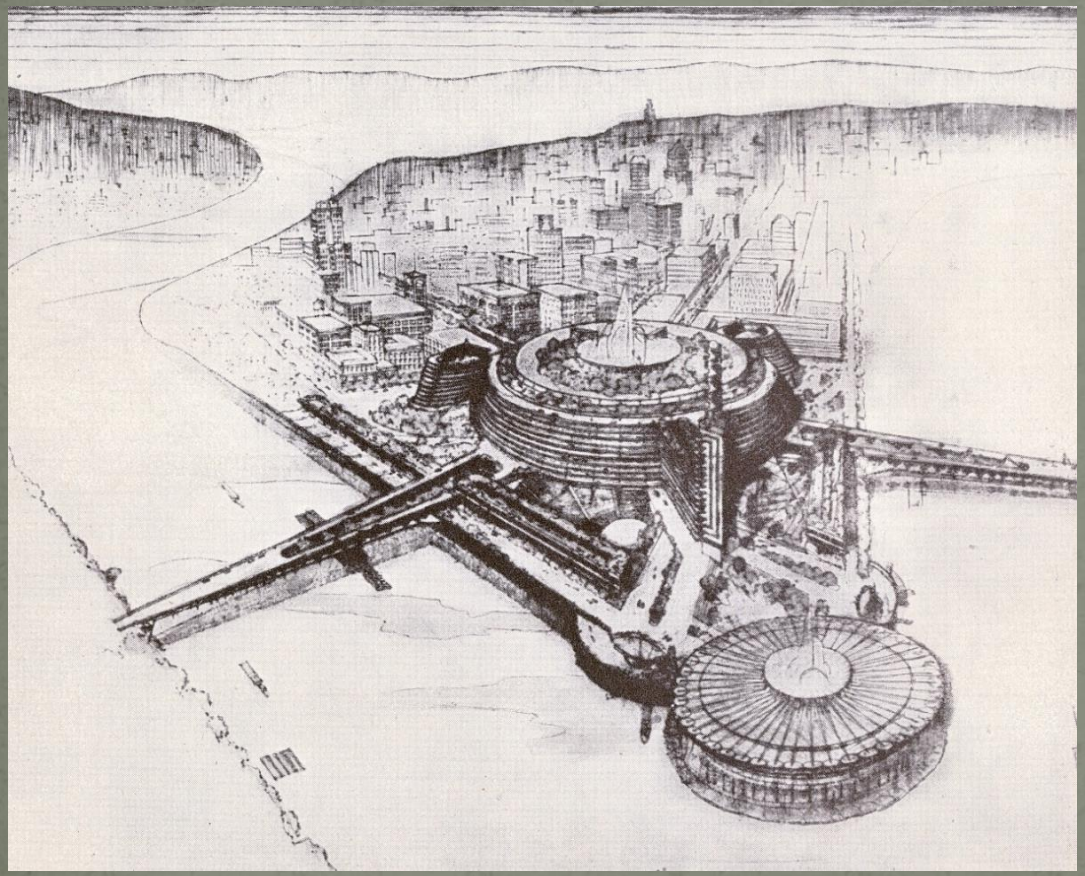
Frank Lloyd Wright "Continuity in the whole"



In 1949Wright designed a **self service garage** for his long-time client Edgar **Kaufmann**, the department-store magnate for whom the architect built one of his best known buildings, Fallingwater (1934-37).

The garage is to be formed by spiraling concrete ramps with a central open court.

Frank Lloyd Wright "Continuity in the whole"



Three of Wright's six spiral-formed buildings, the Gordon Strong commission of 1924, **the Pittsburgh Point Park Civic Center, 1947-48** (left) , and the Self Service Garage for Pittsburgh of 1949, were large-scale, automobile - accommodating structures, but none of these were realized.

The Point Park Civic Center, Pittsburgh, left.

Frank Lloyd Wright "Continuity in the whole"

The most internationally prominent use of steel-reinforced concrete ramps in modern architecture was for automobile buildings, such as those designed by **Albert Kahn for the Ford Motor Company** near Detroit, which dated form 1909 to 1922.

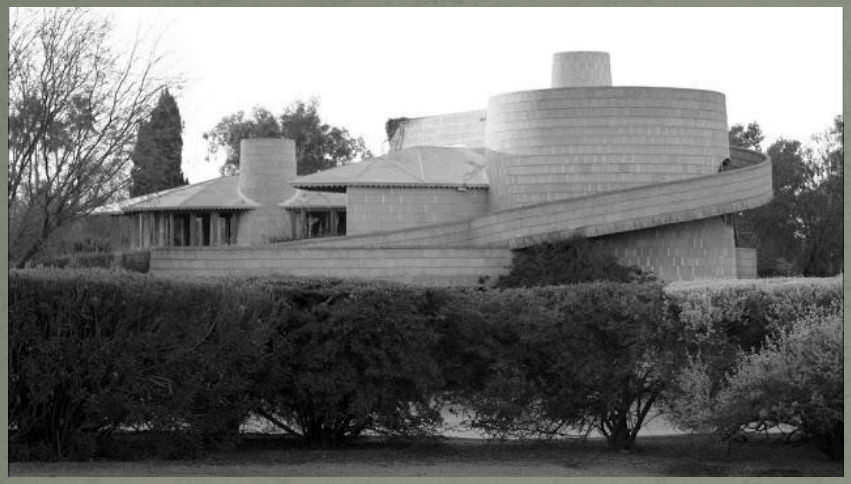
Frank Lloyd Wright "Continuity in the whole"

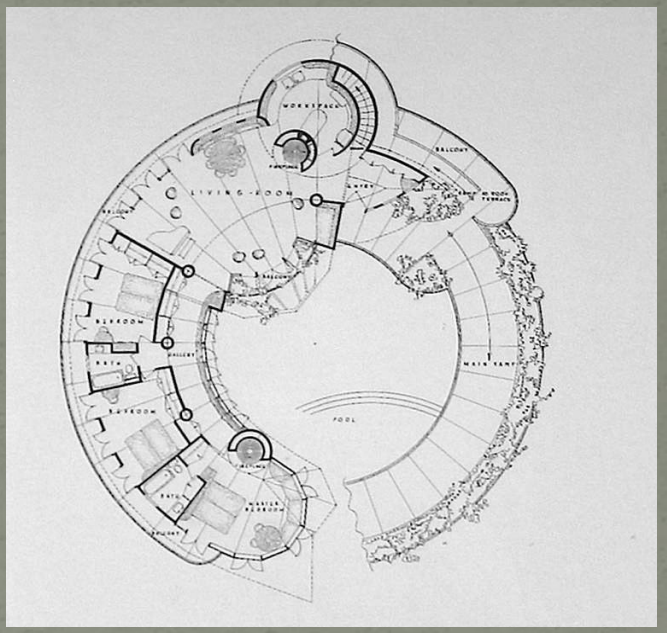
G. Matté Trucco, Ramp leading up to rooftop test track in former Fiat factory Lingotto Turin, 1923-1926.

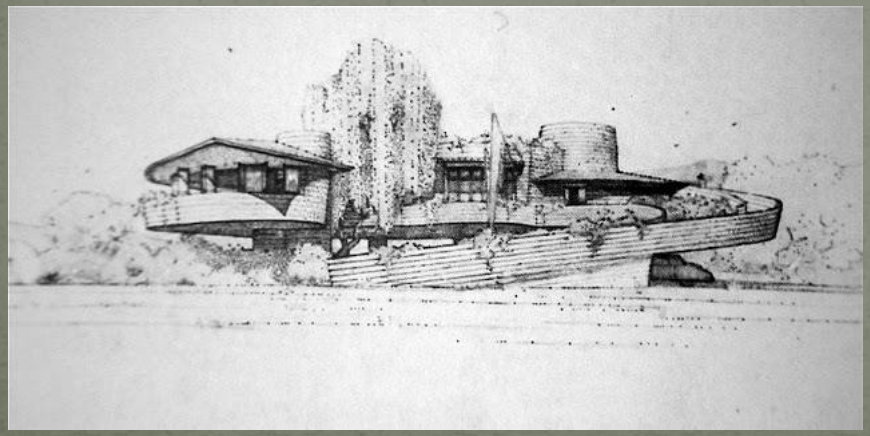
Frank Lloyd Wright "Continuity in the whole"

The earliest spiral ramp built by Wright that approximates the function and form of the Guggenheim is in his remodeling of the **V.C.Morris Gift Shop in San Francisco (1948-49).** The Morris's ramp, circular rather than spiral, more steeply inclined and rising only one store , is held on thirty-two steel beams arrayed radially around its circumference.

Frank Lloyd Wright "Continuity in the whole"

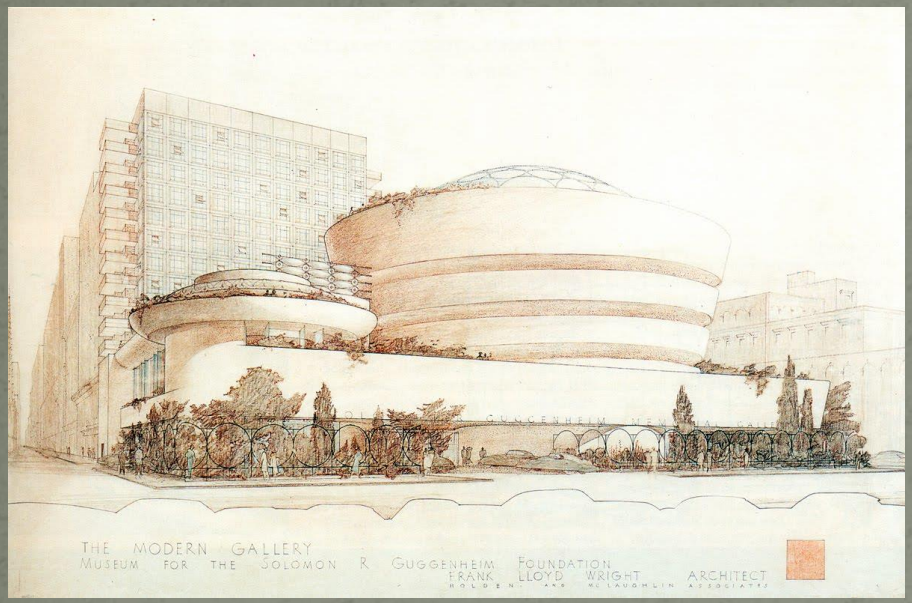






Wright realized the circularly curved ramp at a smaller scale than the Guggenheim in his son David Wright's house (1950-52) near Phoenix.

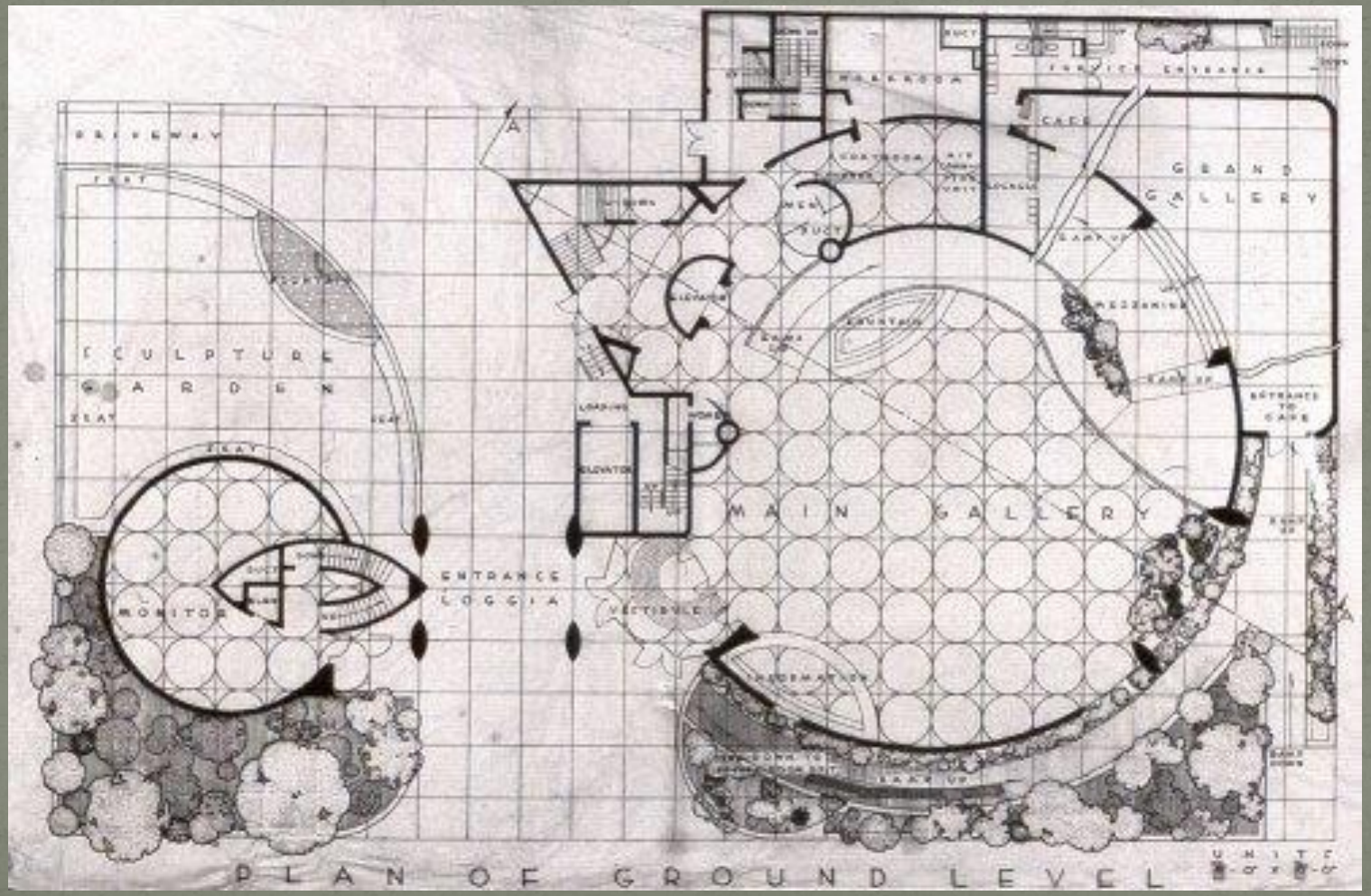
Frank Lloyd Wright "Continuity in the whole"



With this design, the spiraling, expanding rotunda shifted to the southern portion of the site, with the annex (which was to include an apartment for Rebay), on the Eighty-ninth Street half, transformed into the present-day administrative monitor structure. Also added was a provisional, glazed, fifteen-story tower for offices .

Wright's revised plans were approved by the board of trustees early in 1952, and he was awarded a new contract based on a revised cost estimate of two million dollars.

Frank Lloyd Wright "Continuity in the whole"



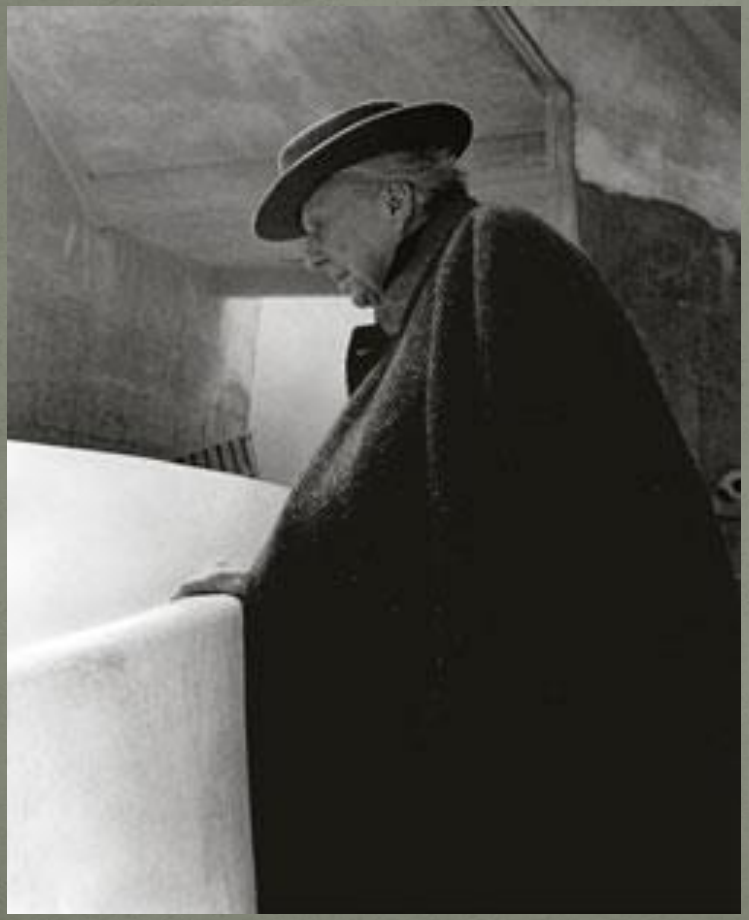
Frank Lloyd Wright "Continuity in the whole"

In the Guggenheim's building Wright realized the essential idea of structural and spatial continuity in the main gallery or "**grand ramp**" as he called it. This gallery's spiral of steel-reinforced concrete was among Wright's most radical and technically challenging schemes, posited in opposition to Manhattan's rectilinear steel-framed skyscrapers. Wright saw the the Guggenheim's spiral as a cantilever, the form that signified his democratic ideal for modern architecture.

Frank Lloyd Wright "Continuity in the whole"

"For the first time in the history of architecture a true logarithmic spiral has been worked out as a complete plastic building in which there is but one continuous floor surface: not one separate floor slab above another floor slab, but one, single, grand, slow wide ramp, widening as it rises for about seven stories – a purely plastic development of organic structure".

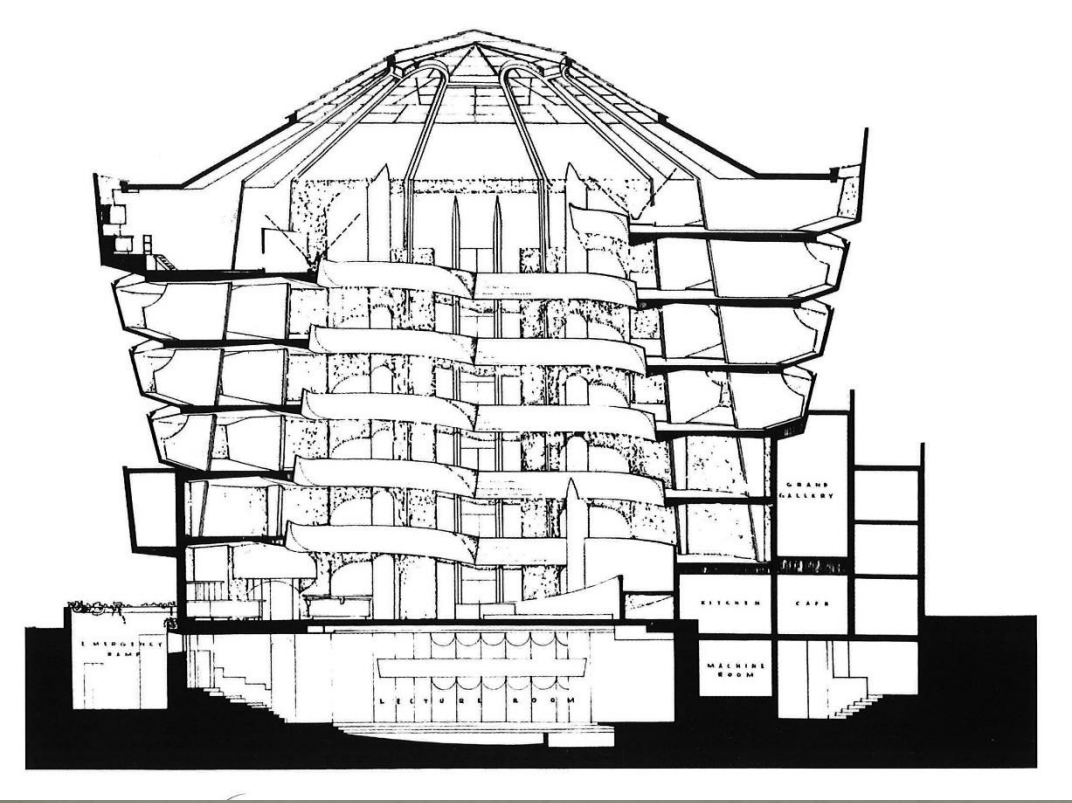
Frank Lloyd Wright "Continuity in the whole"



Wright's concept of an inverted ziggurat alludes to modern structural capability of **cantilevered steel-reinforced concrete** to create **continuous space** unlike that of the ancient inward-stepping temples of solid stone tiers.

Because of its unusual geometry as a self supporting structure, the Guggenheim was difficult to evaluate with existing building codes. So Wright and his collaborators - Jaroslav Polivka, William Wesley Peters, Mendel Glickman, Jacob Feld -redesigned the building.

Frank Lloyd Wright "Continuity in the whole"



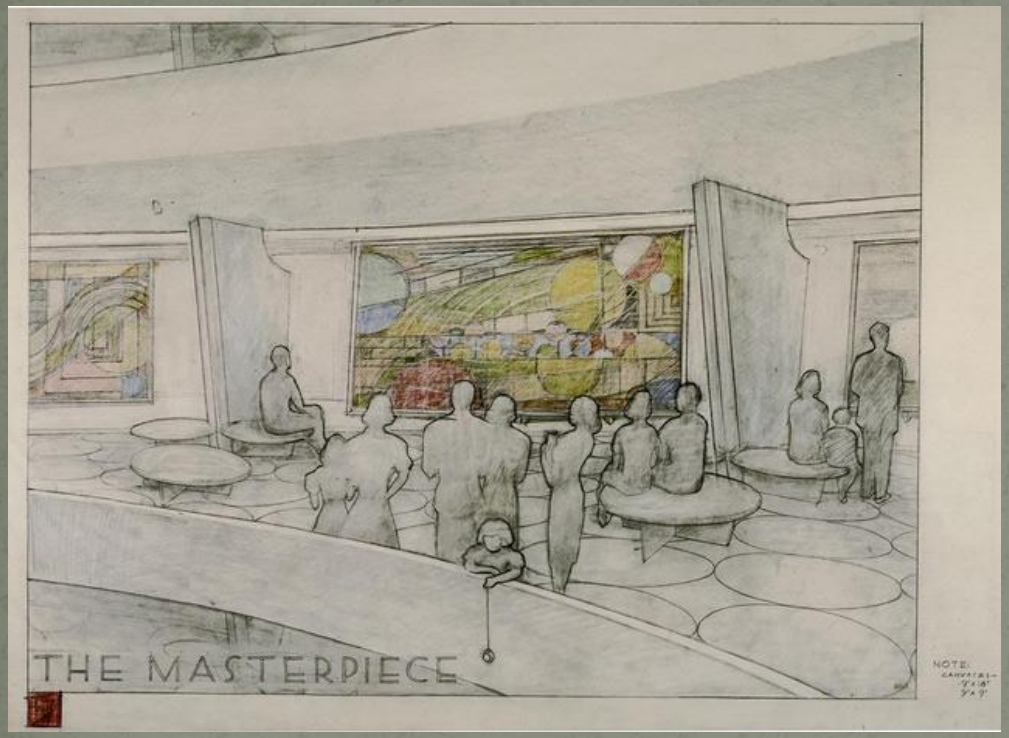
In the modified version of the spiral the radially oriented concrete web piers are widest at the top, where the ramp increases to over 50 feet.

At all levels ramps cantilever in from the webs by 14 feet 6 inches and taper to a minimal depth.

Frank Lloyd Wright "Continuity in the whole"

In 1953 photographer Pedro Guerrero made a series of famous photos of Frank Lloyd Wright using his hands to explain the principles of his "organic architecture" (in contrast to then-ascendent "modernism") as he had done earlier on the *Today Show* with Hugh Downs.

Frank Lloyd Wright "Continuity in the whole"



In 1958 Wright prepared a series of large-scale perspective drawings to demonstrate to the board of trustees of the Solomon R. Guggenheim Museum how the ramps and walls of the museum would accommodate paintings of various sizes. In one, "The Masterpiece", a small girl leans on the interior parapet wall and looks down into the rotunda space. Moments before meeting with the trustees, Wright took out his pencil and deftly added the yo-yo that hangs from the girl's hand, saying to his apprentices, "Boys, we must never lose sight of our sense of humor."

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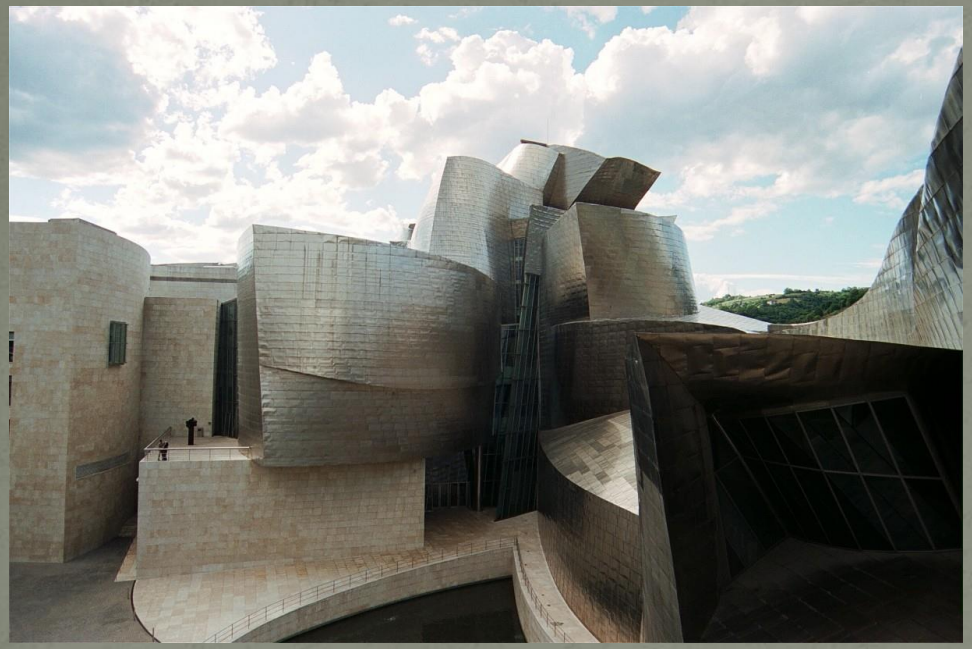


Altogether, Gehry's design creates a spectacular sculpture-like structure, perfectly integrated within Bilbao's urban pattern and its surrounding area.

Designed by American architect **Frank Gehry**, the Guggenheim Museum Bilbao (1993-1997) building represents a magnificent example of the most groundbreaking 20th-century architecture.

With 24,000 m2, of which 11,000 are dedicated to exhibition space, the Museum represents an architectural landmark of audacious configuration and innovating design, providing a seductive backdrop for the art exhibited in it.

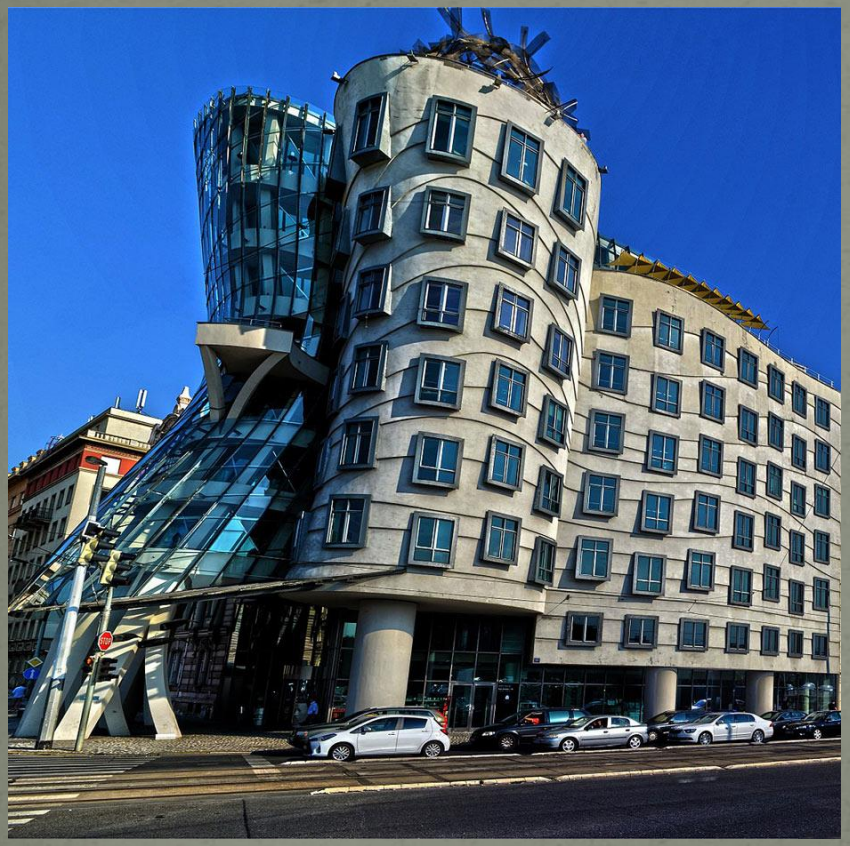
Frank Lloyd Wright "Continuity in the whole"

For the outer skin of the building, the architect chose **titanium** after ruling out other materials and seeing the behavior of a titanium sample pinned outside his office. The finish of the approximately 33,000 extremely thin titanium sheets provides a rough and organic effect, adding to the material's color changes depending on the weather and light conditions.

Frank Lloyd Wright "Continuity in the whole"

Due to the mathematical complexity of Gehry's design, he decided to work with an **advanced software** initially conceived for the aerospace industry, CATIA, to faithfully translate his concept to the structure and to help construction.

Frank Lloyd Wright "Continuity in the whole"

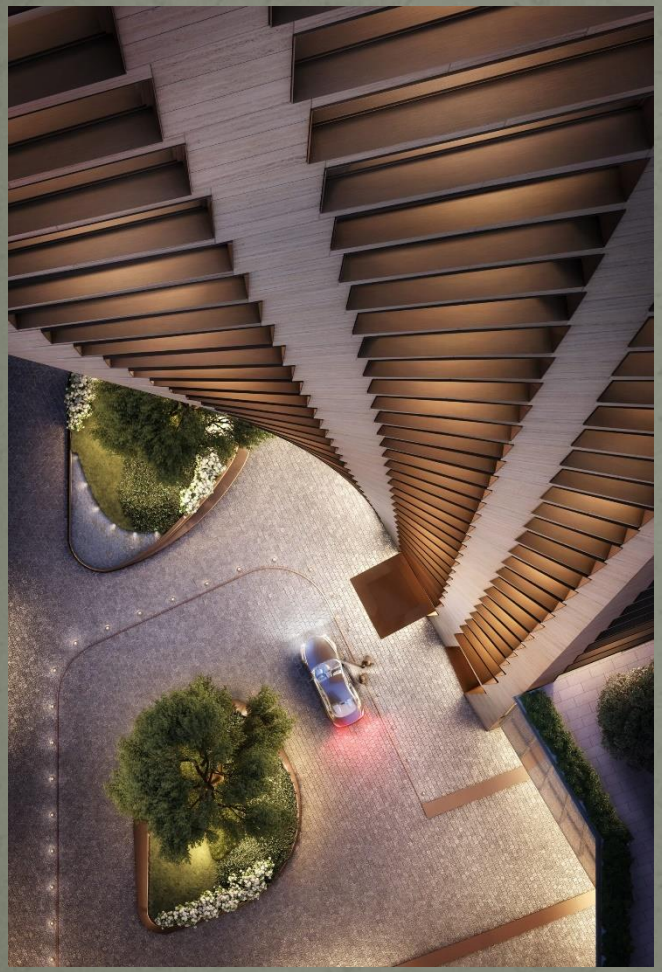


The **Dancing House** (or Fred and Ginger) by **Frank Gehry,** Prague, Czech Republic
Perhaps the most iconic "dancing" building, Gehry's design for the Nationale-Nederlanden insurance company was created with Croatian-Czech architect Vlado Milunić and now operates as a hotel. The project, completed in 1996, was nicknamed by Gehry after Hollywood dance partners Fred Astaire and Ginger Rogers because its sculptural front looks like a taller male figure sweeping away a cinched glass form by its side.

Frank Lloyd Wright "Continuity in the whole"

Ingels' firm BIG recently unveiled new images of **The XI** (The Eleventh), a development beside the High Line. The architect told that the pair of towers, containing residences and a hotel, twist around each other in a "dance" that enables both buildings to enjoy views of the Hudson River on one side and the popular elevated park to the other.

Frank Lloyd Wright "Continuity in the whole"



The facades of the towers twist to prevent blocking views from one another.

Frank Lloyd Wright "Continuity in the whole"

Although yet to be realised, **Studio Libeskind** planned this trio of skyscrapers for a large business district development near **Seoul in 2012**. The curvaceous glass forms, arranged close together atop a podium, are based on the sleeves of costumes worn by traditional Korean Seung-Moo dancers.

Frank Lloyd Wright "Continuity in the whole"

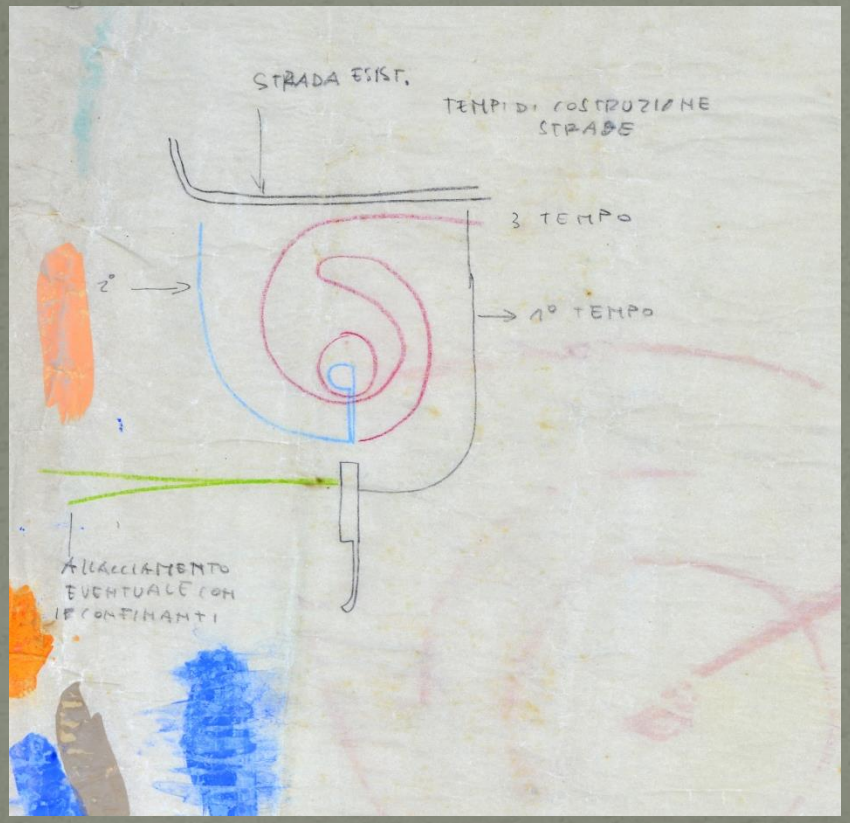
Zaha Hadid Architects has completed a twisted tower that soars 170 metres above **Milan**, making it the third tallest building in the city. The international architecture firm's recently completed **Generali Tower** is one of three skyscrapers being built at the **CityLife** development on the previous site of Milan's trade fair grounds. Nicknamed **Lo Storto, or, The Twisted One**, Zaha Hadid Architects' (ZHA) 44-storey tall tower joins Arata Isozaki's 202-metre high Allianz Tower, which completed in 2015.

Studio Libeskind's 175-metre tall PwC tower will complete the trio of skyscrapers when it completes in 2019.

Frank Lloyd Wright "Continuity in the whole"

On a rainy, windy Sunday, as in a Svevo or Hemingway novel, we rushed towards Monfalcone, towards Aquileia, towards Latisana,and soon after we took the road that led into our little jungle, the Pinewood of Lignano, where a group of pioneers had entrusted Marcello D'Olivo with the task of studying the layout of a vacation town between the Tagliamento River, the trees and the sea. A town set amidst small dunes of golden sand. (L.Sinisgalli 1954, 37)

Frank Lloyd Wright "Continuity in the whole"



The competition organised by the newly established Lignano Pineta Company was won by Marcello D'Olivo (who conceived the "spiral" destined to become the iconic image of the new seaside town. It is not easy to reconstruct the motivations and reasoning that led D'Olivo to choose the spiral form, about which there are several versions, impossible to verify, but precisely for this reason they contribute to the overall charm of the foundation tale.

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- *"The streets, in their essential pattern, create form a progressively widening spiral; the external lower curve of the spiral is the starting point of the roads leading to the sea, which in turn follow a parabolic path, while a major artery with two widely separate lanes –so as to include the area allocated for the construction of a single large building hosting shops and meeting spaces, and which will extend nearly 550 meters – creates a sine curve and connects the central square to the beach. The abandonment of the traditional street grid and the adoption of the curved path just described, provides obvious aesthetic effects and technical advantages. The view changes constantly; the pine forest, growing on an undulating terrain, continually creates new frames of mountain scenery; each lot has direct access to the road so, by eliminating all rights of passage, buildings can be steeped in the woods; road traffic is easier and safer thanks to the almost total lack of dangerous right angle crossings. Lastly, every crossing of building areas with lines and pipelines is avoided, since the electrical, plumbing and sanitation systems follow the road layout"*

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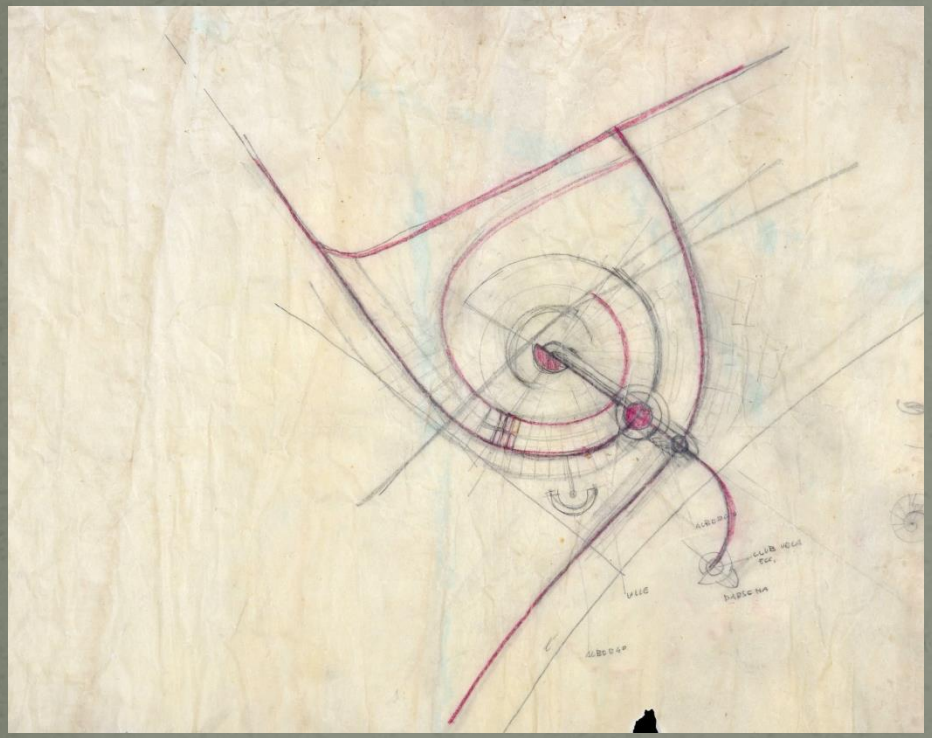
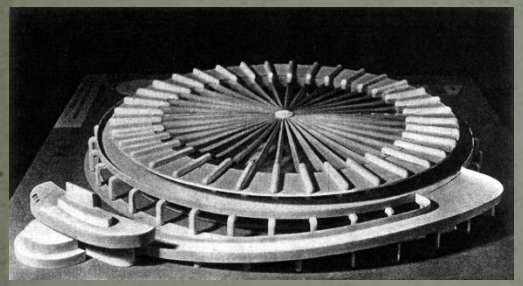
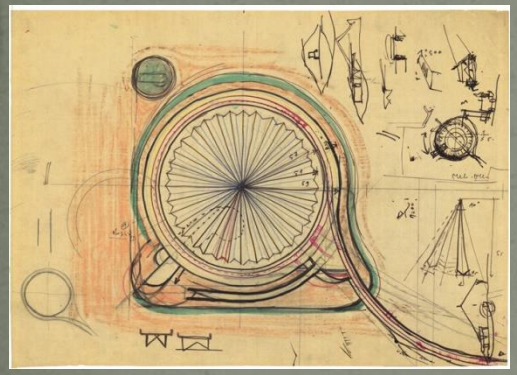


The **central role that traffic** planning played in D'Olivo's project is, in Francesco Tentori's opinion, the element that characterized his entire plan. Tentori has defined **Lignano Pineta as "the first automobile landscape"** .The route, with its continual variations, fully reveals itself only to the motorist. Hence the architecture is no longer designed for the pedestrian, but for the person in movement, the voyager on modern means of transport, who sees the landscape from a completely different perspective.

Frank Lloyd Wright "Continuity in the whole"





D'Olivo had already dealt with the relationship between architecture and automobiles in the **1951 project competition for Trieste's produce market**, where he offered a structural solution in the form of a circular building made of shelves in prestressed concrete arranged radially. A **large ramp allowed truck access** to the roof from which the unloaded goods were carried down to the shops below: the shape of the market addressed the major problem of vehicular circulation by offering an innovative, original solution, even in terms of structure with the use of prestressed concrete, which led him to request the collaboration of **Silvano Zorzi**, one of the finest Italian structural engineers of the time. The curved ramp is a motif that twentieth-century architecture turns to in garage design, a kind of building that, thanks to reinforced concrete, solves the problem of parking, which has become increasingly crucial in modern cities .

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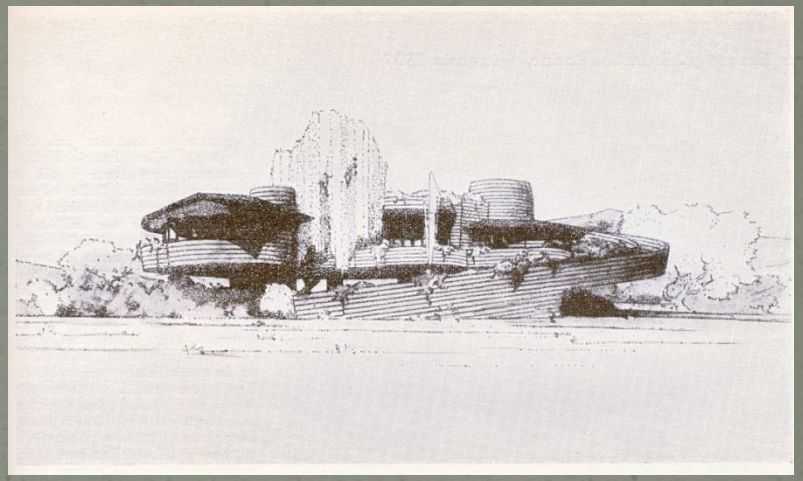

In the US **Wright drew inspiration from garages** to design the Gordon Automobile Objective and Planetarium atop Sugarloaf Mountain in Maryland. (1924-25), an architecture in the shape of a truncated cone, whose large ramps encircling it on the outside traced a modern ziggurat. Wright wrote to his patron, Chicago businessman Richard Strong, stating that the idea had come to him from reflecting on such **famous spiral-shaped** buildings as the Tower of Babel or the Tower of Pisa, but he was also inspired by a snail shell.

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- Among D'Olivo's drawings there are four heliographic copies that illustrate the different methods of drawing spirals, both the one by Archimedes, also defined as **arithmetic or uniform**, and the **logarithmic**, also known as geometric and proportional, for which the mathematician Jakob Bernoulli coined the term **"spira mirabilis".** The texts accompanying the illustrations were probably taken from math or descriptive geometry textbooks, but may be the reworking of notes taken during university classes or materials prepared for an exam.
- The text describing the equiangular spiral of the Nautilus makes reference to the fact that it can be considered a cone wrapped around itself, a consideration that if translated into the language of architectural shapes configures the emblematic ziggurat of the Tower of Babel. Among the methods used to draw a spiral, described in another of the drawings, there is one that uses rectangles or triangles where the sides are in the proportion of the golden section. **For a classical architect the spiral was a familiar shape, since it was used for the volutes of the Ionic capital.**

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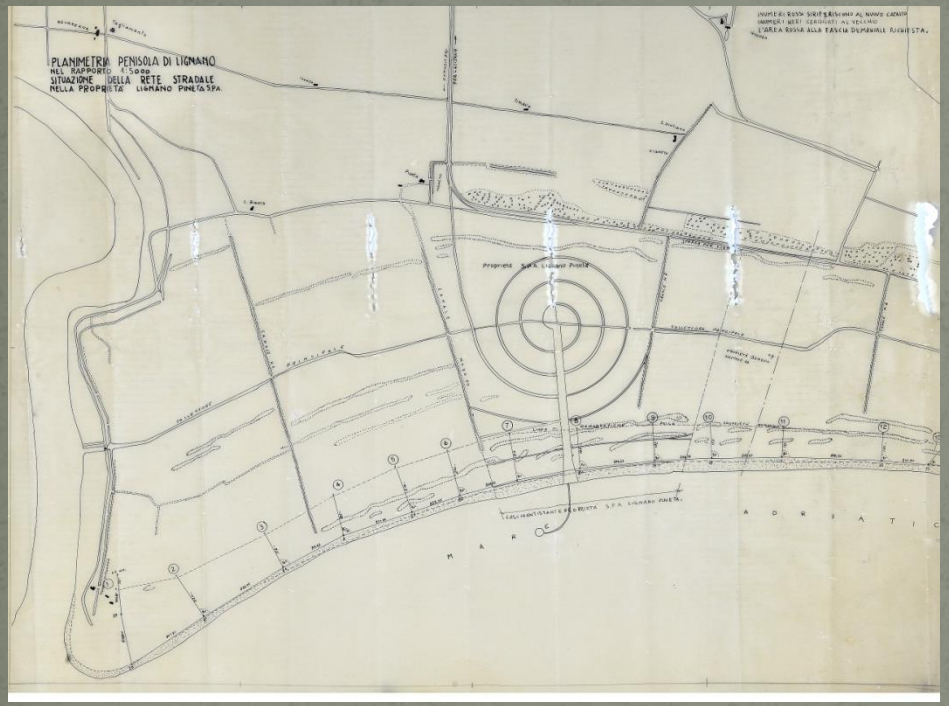

In the ink drawing on tracing paper which describes the *Blueprint of the peninsula of Lignano, situation of the road network in the Lignano Pineta spa estate* inside the trapezium enclosing the area of interest, looms the spiral of Archimedes, the one with a uniform growth: D'Olivo has now chosen his geometric matrix, but in this variant the "great way" follows a straight line, but it will take on a curved path in the final version ("the train"). When Sinisgalli visited Pineta he was able to admire the final plan, which he described with the appreciative awareness of a lover of geometry.

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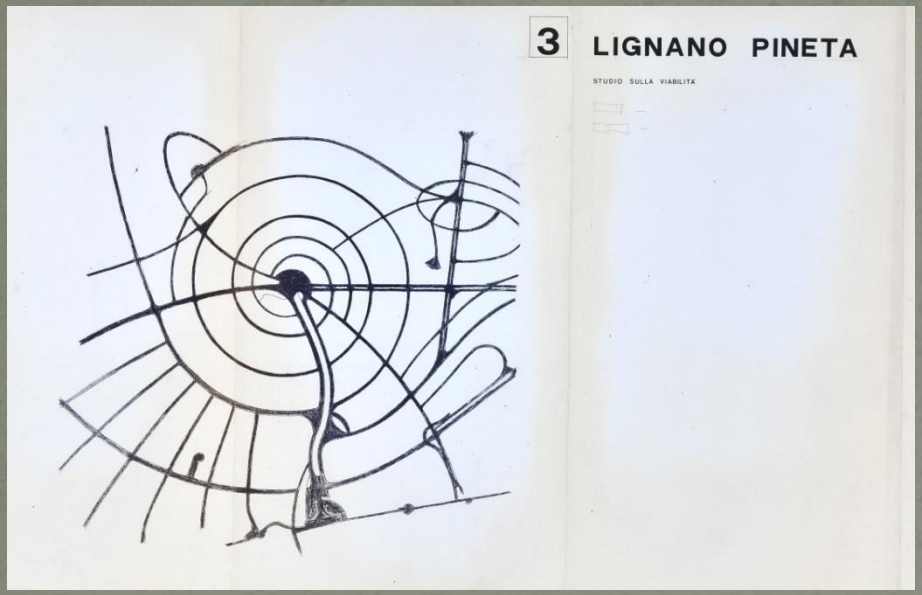

The plan shows the different areas created by the road layout, these corresponding to the different function assigned to each area. The curvilinear arrangement of the inner road, in addition to eliminating continual intersections, makes it possible to reach any point on the blueprint in a minimum of time and space. (L.Sinisgalli)

"From the area's centre of gravity, 54 meters from the centre, we have built on the West radius a spiral with a constant 3-meter progression for every 10 degrees of movement. All subsequent calculations depend on this initial formula: the parabolic linkage with the road, the central sinusoid, the ellipses to the north, the parabolas towards the sea and the other traffic roads for a total length of 15 km.

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