

30 Amazing structure in the world

# **30 Amazing Structures In The World.**

**By Pranav Padmane**

**Founder , Civilbuzz.**

**THIS BOOK IS CONTRIBUTED  
TO THE ALL THE CIVIL  
ENGINEER WHICH ARE WORK  
HARD TO DESIGN THE WORLD.**

## The pyramids:

A pyramid is one of the ancient structure which is in the geometrical triangular shape and which is still exists. Its base point is converging to the single point.



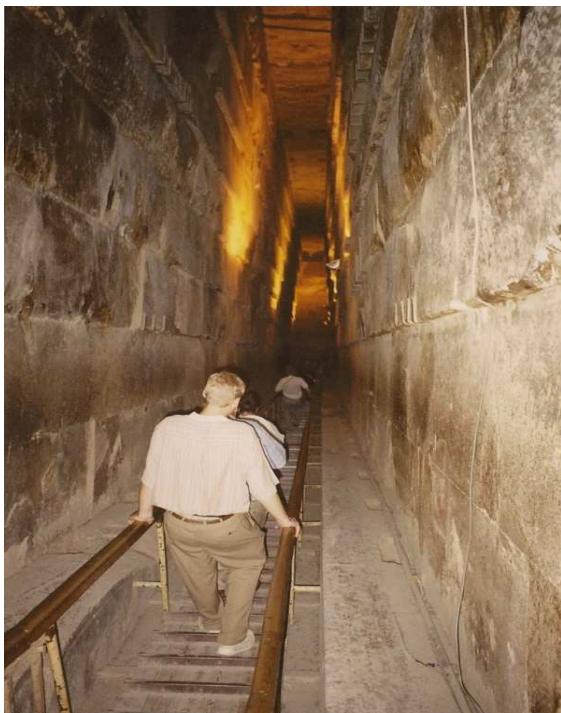
The pyramid is design in such a way that its most of the weight is at closer to the ground and less material is used at the top of the pyramid so as to keep the load minimum as possible. The pyramids have built by civilization in many parts of the world.

Red pyramids in the dasher hecropolis and then the great pyramids of the Khufu, both of Egypt. The latter the only one of the seven wonders of the of the ancient world still remaining.

It contains around 13,00,000 blocks ranging in eight from 2.5 tons to 15 tones and is built between on square base with sides measuring about 230m covering 13 acres.

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The most famous pyramids are present in the Egypt which present in the Egypt which is made up of bricks and stones. The pyramids are polish to give reflective surface from the distance. These pyramids are constructed between 2700 BC to 1700 BC. The first pyramid was built during the third dynasty by king djoser by architect Imhoter



Ancient Egyptian pyramids were in the most cases places west of the river Nile. As of 2008, 153 pyramids are discovered in Egypt. In which great pyramid of Giza is a tallest pyramid until the LINCOLN CATHEDRAL was finished in 1311 BC. This pyramids are constructed to make contact with god which is the sun. So, pyramids are constructed with reference too the sunlight.

## Leaning Tower of Pisa :



The leaning tower of Pisa is the campanile or freestanding bell tower of cathedral of Italian city of Pisa. The Tower is tilt at one side due to its over weight on one side. The tilt was increased as the construction is carried out. The height of leaning tower is 55.86 m on one the side which is tilt and 56.67 on the higher side. The weight of the leaning of tower is 14500 tones . The tower has 296 stairs. The tower lean at an angle of 5.5

degree at the times of construction and it is now 3.99 degrees.

The construction of leaning tower of Pisa is going on for the 199 years due to various battles and improper management of work. The construction of tower is carried out in the different floors. The tower begins to sink after the construction of second floor of tower. This is due to the foundation of tower is laid on unstable and unsuitable soil strata. After that construction was stopped due to continuous battles. In 1199 the clock was temporarily installed to the third floor of the leaning tower of Pisa.

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Stairs in leaning tower

The seventh floor was completed in 1319. It was built by Tommaso di Andrea Pisano who succeeded in harmonizing the Gothic element of the bell-chamber with the Romanesque style of the tower. There are seven bells, one of each note of the musical scale stage. The largest one was installed in 1655. The bell-chamber was finally added in 1372.

## Colosseum :



The Colosseum is an amphitheatre of the Roman Empire and is considered an example of the greatest Roman architecture and engineering. It was constructed under the emperor Vespasian in 70 AD and completed in 80 AD under his successor and heir Titus. The capacity of the Colosseum is between 50,000 to 80,000 people and was used for gladiatorial contests and public spectacles such as animal hunts, executions, and drama on classical mythological themes. The Colosseum is huge, an ellipse 188m long and 156m wide. Originally 240 masts were attached to stone corbels on the 4th level. Vespasian ordered the Colosseum to be built on the site of Nero's palace, the Domus Aurea, to dissociate himself from the hated tyrant. His aim was to gain popularity.

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The colosseum was covered with an enormous awning known as the velarium. This protected the spectators from the sun. It was attached to large poles on top of the colosseum and anchored to the ground by large ropes. A team of some 1000 men was used to install the awning.



The southern side of the colosseum was felled by an earthquake in 847. Parts of the building including the marble cladding were later used for the construction of other landmark buildings such as St. Peter's Basilica and Palazzo Farnese.



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### Taj Mahal :

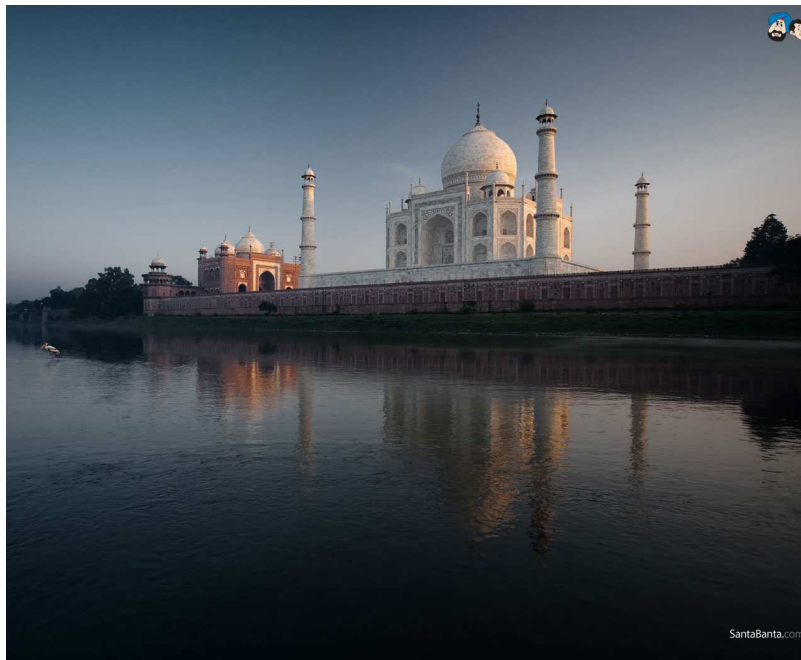


Taj Mahal is a white marble structure situated at Agra, Uttar Pradesh, India. Taj Mahal was constructed by Mughal emperor Shah Jahan in the memory of his third wife Mumtaz Mahal. The construction of Taj Mahal was begun around 1632 and was completed around 1653. In 1631, emperor's most lovingly begam Mumtaz died while the birth of their 14<sup>th</sup> child. The principal mausoleum was completed in 1648 while surrounding buildings took five years more to complete. It requires 20,000 workers' labour and Shah Jahan spent 32 crore rupees during the construction of this beautiful structure.

There are many myths about the Taj Mahal. According to one myth, the construction is sinking and it is known as the cracks are observed in the structure after the completion in just 4 years in spite of all precautions and it was tilted towards the river side.

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According to another myths, the number of items such as diamonds, a gold leaf which covered the part of the dome, a pearl blanket etc that were originally a part of taj mahal is stolen . Shah Jahangot the hands of worjers and architects who constructed the taj mahal so that they cannot create such marvelous and beautiful structure in t heir lifetime



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**Pantheon** : Pantheon is a building in Rome, Italy commissioned by Marcus Agrippa during the reign of Augustus (27 BC - 14 AD) and rebuilt by the emperor Hadrian about 126 AD



In the aftermath of the Battle of Actium , Marcus Agrippa started an impressive building program: the Pantheon was a part of the complex created by him on his own property in the Campus Martius in 29-19 BCE, which included three buildings aligned from south to north: the Baths of Agrippa, the Basilica of Neptune, and the Pantheon. It seems likely that the Pantheon and the Basilica of Neptune were Agrippa's *sacra privata*, not *aedes publicae* (public temples). This less solemn designation would help explain how the building could have so easily lost its original name and purpose in such a relatively short period of time. It had long been thought that the current building was built by Agrippa, with later alterations undertaken, and this was in part because of the inscription on the front of the temple

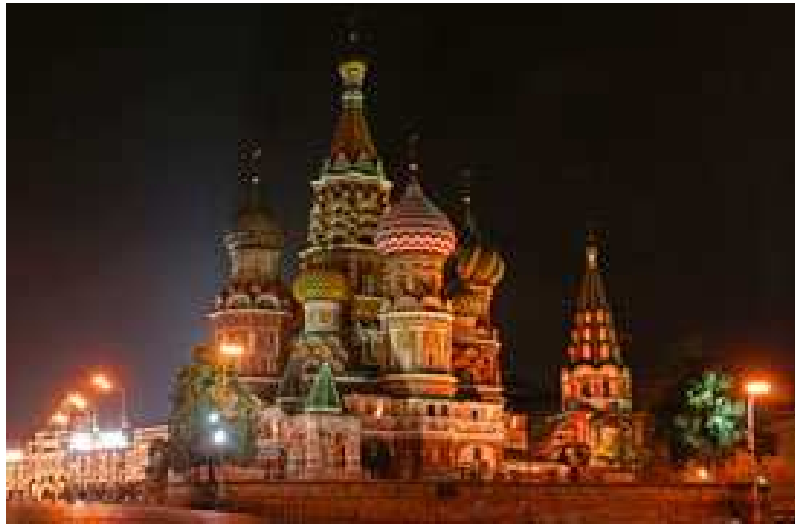
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archaeological excavations have shown that the Pantheon of Agrippa had been completely destroyed except for the façade. Lise Hetland argues that the present construction began in 114, under Trajan, four years after it was destroyed by fire for the second time

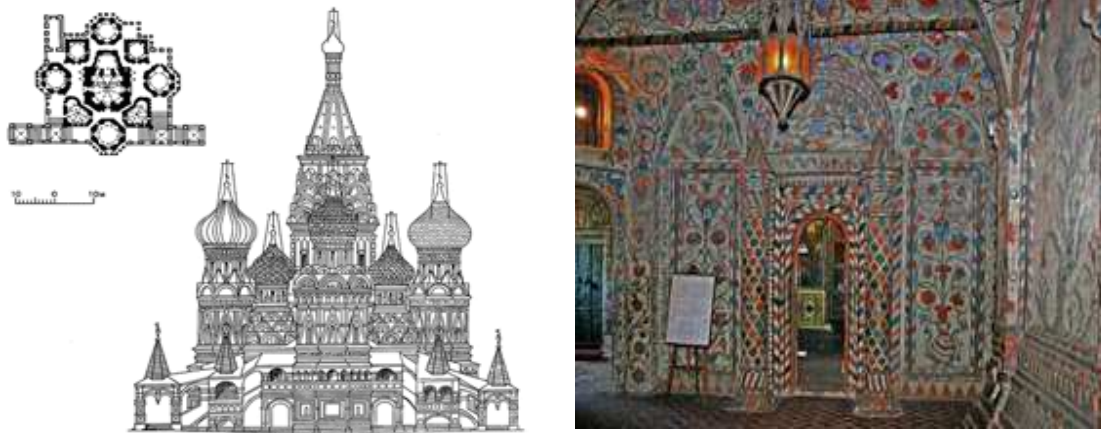
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**St. Basil Cathedral** : St. Basil Cathedral is a former church in Red Square in Moscow, Russia. The building, now a museum, is officially known as the Cathedral of the Intercession of the Blessed Virgin on the Moat.



It was built from 1555–61 on orders from Ivan the Terrible and commemorates the capture of Kazan and Astrakhan. It has been the hub of the city's growth since the 14th century and was the city's tallest building until the completion of the Ivan the Great Bell Tower in 1600. The original building, known as *Trinity Church* and later *Trinity Cathedral*, contained eight side churches arranged around the ninth, central church of Intercession; the tenth church was erected in 1588 over the grave of venerated local saint Vasily (Basil). The building is shaped as a flame of a bonfire rising into the sky. The site of the church had been, historically, a busy marketplace between the St. Frol's (later Saviour's) Gate of the Moscow Kremlin and the outlying posad. The centre of the marketplace was marked by the Trinity Church, built of the same white stone as the Kremlin of Dmitry Donskoy (1366–68) and its cathedrals.

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Because the church has no analogues, in preceding, contemporary, or later architecture of Muscovy and Byzantine cultural tradition in general, the sources that inspired Barma and Postnik are disputed. Eugène Viollet-le-Duc rejected European roots for the cathedral; according to him, its corbel arches were Byzantine, and ultimately Asian.

The foundations, as was traditional in medieval Moscow, were built of white stone, while the churches themselves were built of red brick (28×14×8 centimeters), then a relatively new material.

The church acquired its present-day vivid colors in several stages from the 1680 to 1848. Russian attitude towards color in the 17th century changed in favor of bright colors; icon and mural art experienced an explosive growth in the number of available paints, dyes and their combinations.

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**Petronas Tower** : Petronas Tower also known as 'Twin Tower" are situated at kuala lampur, Malaysia. It has 88(+5 basement) floors.



The tower is design by aargentine architecture Cesar Pelli. They choose a distinctive postmodern style to create a 21<sup>st</sup>-century icon for kuala-lampur. The construction was started in the year 1994 and the building was officially open by prime Minister of Malaysia in 1999. The twin towers were built on the site of kuala-Lampur race track. Test boreholes found that original construction site effectively sat on the edges of a cliff. One half of the site was decayed limestone while other was soft rock.

The tower has sky-bridge on the 41<sup>st</sup> and 42<sup>nd</sup> floors, which is highest 2 floor bridge on the world.

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### Empire State Building :



Empire state building was one of the tallest building in the world which is situated at new York , United states of America. It is 103 story building. Its total height is 443m high. Empire state is the name derived from the pet name of New York city. It is the tallest building in the world for 40 year, and after the deconstruction of World trade Center it is again tallest building in the US.

The Empire state building was designed ny William F. Lamb. He produced bilding drawing in just two weeks. The

building was designed from top-down. This building was shown in most of Hollywood movies for ex. King-Kong. In 1964 , Floodlights were added to illuminate the top of the building at night. The lights



play an important roll in beauty of the building. After the death of actress Fay Wray, the building was stood in the darkness for 15 minutes. The building was in lighten in the red, green and yellow as per schedule after the deconstruction of the world trade centre. The antenna was added to the building in 50s to transmission of the FM and several TV channels.



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### Chrysler Building :

The Chrysler building is a skyscraper in New York city , US. It was the tallest building in the world until Empire state building is made. After the deconstruction of the World trade center Chrysler was the second most tallest building in the New York city. It was the headquarter of the Chrysler Corporation from 1930 to mid 50s.

The Chrysler Building was designed by architect William Van Alen for a project of walter P. Chrysler. The construction of Chrysler was started in 1928. It requires total 3826000 bricks. The Chrysler was completed in 1930.



The Chrysler building id considered a leading example of Art deco aechitecture. The corners of 61<sup>st</sup> floor are graced with the eagles; on the 31<sup>st</sup> floor, the corner ornamentation are replicas of the 1929 Chrysler radiatoc caps. The building was constructed of masonary, with a steel frame.

There lightning sets in the top. The first are the V-SHAPED lightning inserts in the steel of the building itself. The top of building was provided with many lights for special occasion.

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### Opera House :



The Sydney Opera House is a multi-venue performing art centre present in Sydney, Australia. It is designed by Jorn Utzon. The facility features a modern expressionist design, with a series of large precast concrete 'shells'. Each composed of sections of sphere of 75.2 m forming the roofs of the structure set on a monumental podium. The building covers 1.8 hectares (4.4 acres) of land and is 183m long 120 m wide at its widest point. It is supported on 588 concrete piers sunk as much as 25m .

Roofs are precast concrete panels supported by precast concrete panels supported by precast concrete panales supported by precast concrete ribs, not shells in a stricty structural sence. It needed 1056006 tiles intwo colour : glossy white and matte cream.

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**Burj Khalifa** : Burj Khalifa is a currently tallest building in the world which is situated in Dubai, United Arab Emirates . It is 828m tall.



The construction of burj khalifa was start at 2004 and is completed in 2009. The bilding was opend officially in the year of 2010, 4 Jan. The burj Khalifa was designed to include 30,000 house and 9 hotels,3 hectors of parkland, at least 19 residencial towers, The Dubai mall and 12 hectors man made Burj Khalifa lake.

According to officials the project like burj khalifa is important for dubai for the foreign investment. The tower was designed by Skidmore,Owings and Merrill who design the William tower and the new world trade center in New York.

Proportionally the burj khalifa uses half amount of steel as compare to the Empire state building. It is constructed by Emaar properties.

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**Burj-al-arab :**



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burj-al-arab is a luxury hotel located in Dubai, United Arab Emirates. It was only 7-star hotel in the world from 1999 to 2008. This building stands on an artificial island 280m from Jumeirah Beach and is connected to the mainland by a private bridge. Burj-al-arab was designed by architect Tom Wright.

The hotel was built by South African construction contractor Murray and Roberts and Al Habtoor Engineering. The building was opened in December 1999. As the building is on the artificial island, engineers drove 40m long piles into the sand. The island takes 3 years to come out of the sea, which is filled with sand, and the building takes 3 years to complete. This building contains 70,000 cubic m of concrete and 9,000 tons of steel.

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**Lotus Temple** : The lotus temple is situated in new delhi, India is Baha'I house of worship. Lotus temple wins thousands awards for his architecture.



This structure is built in the shape of lotus and is completed in 1986. The structure is made in the pure marble. The architecture Furiburz Sabha choose the common symbol of hindu , Buddha , jain , islam society.

Around the blooming petals there are nine pools of water, which light up, in natural light. It looks spectacular. This white marble structure has together 27 lotus petals. It was made to look like lotus float on the water.

This temple is visited by the all the religion and it is open for the all religion. The lotus got double cured surface . The steel is used to design the petals and is galvanized to protect from the rust. These shells have got thickness about six to eight cm.

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### Bucket Building :



The Longaberger Company is an American manufacturer and distributor of hand-crafted maple wood basket and other home and lifestyle products . longaberger uses direct marketing to sell the product.

This seven story , 180000 sq.ft. building was designed by the Longaberger company and excuted by NBBJ and korda nemeth engineering.

The building was opened in 1997. The basket handles weight almost 150 tonnes and which is heated in cold season .

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### The UFO house :



The Sanzhi UFO house situated at Sanzhi District , new Taipei city, Taiwan . this site is owned ny hung kio group. It was constructed in the beginning of the 1978 . However the project wasa abandoned in 1980 due to investment losses and several car accident death during the construction.

The building were scheduled to be torn down in late 2008 despite an online petition to retain one of the structure. This is used as cinemagraphy by MTV.



### **Nakagin capsule Tower :**



Nakagin capsule tower is a mixed-use residential and office tower designed by architect Kisho Kurokawa and located in Tokyo ,Japan.

The building was the world's first example of capsule architecture built for permanent and practical use. The building still exists but has fallen into disrepair . The building is actually composed of two interconnected concrete towers, respectively eleven and thirteen floors, which house 140 prefabricated modules (or

"capsules") which are each self-contained units. Capsules can be connected and combined to create larger spaces. Each capsule is connected to one of the two main shafts only by four high-tension bolts and is designed to be replaceable. No units have been replaced since the original construction. Construction occurred on site and off site. On-site work included the two towers and their energy-supply systems and equipment, while the capsule parts were fabricated and the capsules were assembled at a factory. The capsules were fitted with utilities and interior fittings before being shipped to the building site, where they were attached to the concrete towers. Each capsule is attached independently and cantilevered from the shaft, so that any capsule may be removed easily without affecting the others. The capsules are all-welded lightweight steel-truss boxes clad in galvanized, rib-reinforced steel

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panels. After processing, the panels were coated with rust-preventative paint and finished with a coat of Kenitex glossy spray.

The cores are rigid-frame, made of a steel frame and reinforced concrete. From the basement to the second floor, ordinary concrete was used; above those levels, lightweight concrete was used.

Shuttering consists of large panels the height of a single storey of the tower. In order to make early use of the staircase, precast concrete was used in the floor plates and the elevator shafts. Because of the pattern in which two days of steel-frame work were followed by two days of precast-concrete work, the staircase was completely operational by the time the framework was finished. On-site construction of the elevators was shortened by incorporating the 3-D frames, the rails, and anchor indicator boxes in the precast concrete elements and by employing prefabricated cages.

**Beijing Olympic stadium :**



Beijing Olympic stadium also known as bird nest stadium was specially designed for the summer 2008 olympic. The stadium consists of two independent structures, standing 50 feet apart a red concrete seating bowl and the outer steel frame around it. In an attempt to hide steel supports for the retractable roof, required in the bidding process, the team developed the "random-looking additional steel" to blend the supports into the rest of the stadium. Twenty-four trussed columns encase the inner bowl,<sup>[12]</sup> each one weighing 1,000 tons. Despite random appearance, each half of the stadium is nearly identical. The eastern and western stands of Beijing National Stadium are higher than northern and southern stands, in order to improve sightlines. Though designed for track & field events of the Olympics, the stadium will continue to host sporting events, such as football, afterwards. A shopping mall and a hotel, with rooms overlooking the field, are planned to help increase use after the Olympics.

REMAINING  
STRUCTURE WILL BE  
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