

Tokyo Sky Tree

Tokyo Sky Tree is the newest Japanese landmark, built in Sumida, Tokyo. Standing at an unbelievable height of 634 metres, not only is this digital broadcast tower the world's tallest tower, it is also earthquake resistant. This building was based on the design of the pagoda, a traditional Japanese structure dating back 1300 years,¹ and with multiple restaurants and two observation decks, this tower has already attracted thousands of visitors daily since its opening on May 22, 2012.² But why is the Sky Tree attracting this much attention, and what was the inspiration behind its design?

Within two months of the opening of Tokyo Sky Tree to the public, ten million visitors have been to see this amazing site.³ But why is it attracting so much attention? The views from the observation decks have been said to be incredible. The lower observation deck, the Tokyo Sky Tree Tembo Deck, stands 350m above ground, and gives a 360 degree view of Tokyo. As well as this, the floor contains a cafe, restaurant, and souvenir shop, and has a capacity of 2000 people. Situated 100 metres above the Tembo Deck is the Tokyo Sky Tree Tembo Galleria. To get to this floor, you will walk from 5 metres below this deck through a spiralling glass corridor. This observation deck is able to hold 900 people, and has sections of glass floorings, in which you are able to see directly below you.⁴ These two observation decks are very popular among visitors, as you are given wonderful panoramic views of Tokyo.

This tower is said to be earthquake proof. Is that true? The Tokyo Sky Tree is designed to be resistant against earthquakes. There is a core column that is situated in the centre of the building and is made out of reinforced concrete, which acts as a stationary pendulum as 13 elevators as well as stairs stand within it. The exterior of this tower, however, is a steel tower framing. From the ground to the height of 125 metres, the central shaft and the framing are connected with steel members, leaving the base of the tower extremely rigid. From this height to 375 metres above ground, the core column is connected to the steel framing via oil dampers.⁵ Nikken Sekkei, the architect of the building, states that these oil dampers are able to absorb 50 percent of the energy being exerted from an earthquake.⁶ As well as this, in the event of an earthquake, the designers have included a system of added mass, in other word known as a balanced weight, that counterbalance the structure while the building is swaying in an earthquake.⁸

Additionally, this tower has a rigid design. The base on the ground is in the shape of an equilateral triangle, and is similar to that of a tripod. However, as the building gets taller, the triangle's sides gradually curve until the structure becomes cylindrical at the height of 320 metres. The triangular base provides solid support for everything above it, as the shape

¹ Jappleng University, *The History and Architecture of the Japanese Pagoda*, Jappleng University

² Wikipedia, *Tokyo Skytree*, Wikipedia

³ Kyodo, *Skytree logs 10 millionth visitor*, Japan Times

⁴ Wikipedia, op. cit.

⁵ Tokyo Skytree, *Floor Guide*, Tobu Railway Co., Ltd. & Tobu Tower Skytree Co., Ltd.

⁶ Nikken Sekkei Ltd., *Diagram of Construction*, World Architecture News

⁷ Wikipedia, op. cit.

⁸ Nikken Sekkei Ltd., *Concept of Added Mass Mechanism*, World Architecture News

is rigid. The cylindrical shape is incorporated further up the tower to withstand strong winds,⁹ as the wind will travel around the curve of the tower rather than blow straight into it.

With stunning views from the observation decks and great technology to create an earthquake proof tower, this modern building has incorporated many aspects from traditional Japanese culture. One of the most important of these is definitely their inspiration from the Japanese pagoda, a traditional Japanese structure consisting of many tiers (often three or five). Pagodas are very flexible structures, and can remain standing during earthquakes, although many were destroyed in fires as they are completely made of wood.¹⁰ From this structure, Nikken Sekkei has incorporated the aspect of 'shinbashira' from the design of the pagoda. Shinbashira is the central pillar that is present inside the pagoda, and acts as a stationary pendulum in the event of an earthquake as it hangs in the centre of the building, and has definitely reduced the possibilities of the building falling down in an earthquake.¹¹

As well as this, the Sky Tree is painted an original colour, Sky Tree White. This colour was created based on one of the light shades of indigo from traditional Japanese culture, aijiro. Sky Tree White is created by adding a touch of blue into white, therefore emitting an almost blue glow from the white colour.¹²

In short, the construction and opening of the Tokyo Sky Tree has been a giant leap for Japan. With the development of the seismic proofing technology and the incorporation of Japanese culture with this impressive structure, this building combines both futuristic technology and traditional Japanese culture. The incredible panoramic views to be seen from the tower will only add success to the tallest tower and second tallest structure in the world.

⁹ Wikipedia, op. cit.

¹⁰ Japlang University, op. cit.

¹¹ The Economist, *Why Pagodas Don't Fall Down*, The Economist

¹² Tokyo Skytree, *Colour Design*, Tobu Railway Co., Ltd. & Tobu Tower Skytree Co., Ltd.

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