



**THE CN TOWER**

### **A great engineering achievement in Canada**

For over 30 years the tallest free standing structure in the world, Toronto's CN Tower is an icon of Canadian Engineering. Standing 553.33 meters high and originally constructed as a TV and communications tower to serve the Toronto area, the CN Tower is now also a major tourist site visited by some 2 million visitors each year. Visitors are attracted to the main observation deck at the 346 m level and the Space Deck observation deck at the 447m level. A further attraction is the 360 restaurant at the observation deck level which makes a complete rotation every 72 minutes. In June 1994 a glass floor of 22.8 square meters was constructed on the main observation deck. NCK Engineering was the structural engineering organization on the multi disciplinary team that designed the Tower and construction was carried out by the Foundation Company and Canron.

Following extensive geotechnical investigations, construction started early in February of 1973 and around 30,000 cubic meters of earth and shale was excavated a depth of some 15m deep below grade. A 6.71 m thick concrete "Y" shaped foundation incorporating 7046 cubic meters of concrete and 453.5 tonnes of reinforcing steel and 36.28 tonnes of tensioning cables was then constructed on a solid base of shale. The foundation work was completed in the short space of four months.

Work then commenced on the main tower structure. This 335m concrete shaft consisting of a hexagonal core and three curved support arms was constructed using the slipform technique. With these forms being raised by hydraulic jacks at a rate of about 6m per day, a total of some 40,500 cubic meters of concrete from the on-site production plant was poured continuously until the full height was reached in February 1974. Construction of the Skypod, a seven storey "building" to house the two observation decks and the 360 revolving restaurant was commenced in August 1974. A temporary steel "crown" was erected at the top of the tower and using cables hung from this frame, 45 hydraulic jacks raised the twelve massive forms which were used to construct the brackets that support the main deck and the base of the deck itself. The observation level was completed with a three feet high compression ring on the outside. A concrete platform was cantilevered from the top edge of the tower to create the Space Deck. To erect the antenna which tops the tower, the giant Sikorsky Skycrane helicopter named "Olga" was employed to lift the 36 pieces of the antenna and support them as they were bolted into place. The final piece of the antenna was placed at 9.52am on March 1, 1975 taking the tower to its final height of 553.33 m.

The CN Tower was then listed in the Guinness Book of World records as the World's Tallest Free Standing Structure. This title was changed to the World's Tallest Building and Free Standing Structure in 1996. The CN Tower continued to hold this record for 34 years.

The CN Tower is recognized internationally as an outstanding example of Canadian engineering expertise in both its design and construction and is well worthy of celebration on the 125<sup>th</sup> anniversary of the founding of the engineering profession in Canada.

One Liner: ***Canada's iconic structure of the modern era.***