

Massive change in high rise construction construction essay



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Empire State Building (Chicago, United States of America), built in 1931
Burj Khalifa (Dubai, UAE), built in 2010
Due to the timeline when these projects were built, there is always going to be a difference in the amount of safety precautions put in place, if any at the time of construction. The Empire State building began construction in 1930 and was opened in 1931 which is amazing due to the size of this steel frame building. The construction on this building was very efficient, based on emerging principles of industrialism, assembly lines and division of labour. The Burj Khalifa in Dubai, built in 2010 is the world's tallest building standing at 828m or 2,717 ft tall. The extreme height of this building raised many safety concerns which are discussed in detail below. The Empire State Building had very little workplace health and safety features as workers were expected to turn up and do their jobs. "The project involved 3,400 workers, most immigrants from Europe along with hundreds of steel workers." The construction workers in the 1930's had a motto that was rather grizzly at the time, that "we don't die, we are killed." To understand that motto you have to realise that most of workers never made it to retirement age. The vast majority of labour was immigrants, men of all nationalities who bonded together like brothers, watching each other's back. One slip meant sure death as they balanced against the high winds that blew in from the Hudson River. One of their vital rules was to never look down. New workers, some aged between 14 and 16 would have to walk the steel on their own without any harnesses which meant that if you slipped, you would die. Back in the 1930's you didn't have safety lines or helmets, safety glasses, high visibility clothing or any stuff like that. Furthermore there was no such thing as compensation back in them days, so if you fell down it would mean death. With the depression gripping New York during

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construction of the Empire State Building there was always someone to take your place. Many workers were scared if they complained regarding safety issues or stopped work due to injury that they would lose their jobs and income for their families." Steel beams and stonework were prepared off-site, and then delivered ready to be inserted into place by workers. A series of hoists and narrow-gauge tracks inside the building moved the pieces to the top-most floors, while large external winches were used for heavy stone pieces. Workers perched hundreds of feet above street level as they riveted steel girders. While the project was considered very safe for the era and complexity, six workers died. " On the other hand, workplace health and safety was a prime factor in the design of the Burj Khalifa building. The construction of this 160 floor tower began in early 2004 and finished in 2010 at an overall cost expected around \$1.5 billion (US). Construction workers from all over the world came to work on different aspects of the building. During the peak of construction over 12,000 workers were on site every day, with over 60 contractor companies responsible for these works. Impressive safety measures were implemented throughout the building of the Burj Khalifa. Workers initially were put through an extensive training course and even attended daily sessions to remind them about health and safety issues while working on site. The higher you climbed the more thorough was the safety, which also depended on the type of work that was to be done. Strict, "almost military like" rules (Mohammad Moiz Al Deen, health and safety manager at Burj Khalifa) including a strict no smoking policy was enforced throughout the project, with over 100 people being fired for various incidents. On site were paramedics, rescue teams, and cages that could be used to lower people to the ground in a hurry on cranes if need be.

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Emergency helicopters were on stand-by for transport and even a couple custom helicopters built for firefighting and rescue operations. Despite the extensive safety precautions there was a single death reported in June of 2007, though a single death is impressive considering the amount of people moving through a fairly dangerous construction site. In the unlikely event of a fire, all personnel inside the building could walk to a pressurised, air-conditioned refuge area located approximately every 25 floors as people could not be expected to walk down 160 floors of stairs. Speed of evacuation and fire safety were both prime factors in the design of the Burj Khalifa. Safety features designed and constructed into the building include the ability to withstand earthquakes higher than 7.0 on the Richter scale. The Burj Khalifa was also designed to incorporate the following safety features:

- Hexagonal core with Y-shaped buttresses for structural support
- Capacity to withstand 7.0 magnitude earthquakes
- Concrete reinforcement around stairways
- World's fastest elevators
- 38 fire- and smoke-resistant evacuation lifts

Safety rules and regulation in Dubai are generally very strict, as workers were kicked off site if not met. All labour workers were required to wear long sleeve high visibility clothing, a hard hat, safety glasses and safety boots. Along with this, detailed safety management plans were implicated to comply with relevant statutory obligations, codes of practice and industry standards to ensure all requirements were met. All personnel during construction of the Burj Khalifa were required to complete safety training with their respected employer and complying with safety measures put in place by the head contractor. Furthermore, it was a requirement for workers to be skilled trained and carry the required safety certificates for site specific work. It is a further requirement from the head contractor to get site

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inducted before commencing any work on a project. This shall include the sign off on work method statements which should describe all work being performed and the correct method to carry out the job to minimise the risk of injury or disease. There was very minimal safety back in the 1930's when construction began on the Empire State Building and overtime has become more apparent due to the updated building methods and as technology has progressed. Workplace health and safety and safety in design are the biggest factors in construction today as technology has increased and people are able to see where risks may occur. The safety officers at the Burj Khalifa construction site did an outstanding job for the size and type of project it was. There was only 1 reported death in the six years of construction from a man that fell however there were a number of other reported injuries due to heat related illness. Similarly, the large majority of workers on both these projects were immigrants from overseas who flew over and worked for the time of construction. Many of these people worked under very harsh conditions for very little money as there was no labour union or government at the time. Many employers confiscated the passports of their employees to retain workers for the duration of the project. The danger of work is usually measured by the number of injuries or fatalities occurring to a group of workers, usually over a period of one year. Over the past century such measures reveal a striking improvement in the safety of work in all the advanced countries. Workplace health and safety is both an individual and shared responsibility of all workers and other persons involved with the operation of the construction project. Nowadays, work place health and safety is the most crucial factor in the successful running of any construction project.

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