The Past, Present and Future of Civil Engineer

Said Smoqi[1], Rezarta Uruçi[1], Vasil Balli[1], Rudin Qordja[2]

[1]*Department of Civil Engineering, EPOKA University, Albania*
[2]*Department of Civil Engineering, EPOKA University, Albania*

ABSTRACT

Civil engineering is the oldest discipline after military one. Since ancient times civil Engineers have constructed buildings and structures that would be incredible to be built even nowadays.

Technological improvements have made our lives easier and have given us the abilities to perform duties we couldn't some years ago. Technology also has improved transportation, and this can be seen by the big numbers of roads, bridges etc.

Futuristic technologies used by civil engineers are attempting to solve a lot of important problems of our society, such as pollution, overpopulation, global warming, traffic etc. Most of people know Dubai, and one of the reasons why it is so popular is because of the modern buildings and some of highest skyscrapers in the world.

But despite all this improvement in civil engineering over the years, Albania still remains in chaos. A lot of buildings are built without applying the European standards, creating an urban chaos. Also the roads are not well-planned and this causes a lot of traffic in most big cities like Tirana and Durrës. But what can civil engineers do about this Albania's chaos? Everything is in our hands.

Keywords: Civil engineering, importance, buildings, construction, Albania, future

INTRODUCTION

The Past of Civil Engineering

Talking about the past of civil engineering is very difficult because everything built in those times is special. Each of them has its characteristics and each of them is very different.

Egyptian Engineering (Pyramids):

First we want to talk about the Egyptian engineering and the characteristic buildings of this engineering which are the pyramids. A pyramid is a structure whose shape is roughly that of a pyramid in the geometric sense, that is, its outer surfaces are triangular and converge to a single point at the top.

The shape of Egyptian pyramids is thought to represent the primordial mound from which the Egyptians believed the earth was created. The shape of a pyramid is thought to be representative of the descending rays of the sun, and most pyramids were faced with polished, highly reflective white limestone, in order to give them a brilliant appearance when viewed from a distance. Pyramids were often also named in ways that referred to solar luminescence.

The earliest known Egyptian pyramids are found at Saqqara, northwest of Memphis. The earliest among these is the Pyramid of Djoser which was built during the third dynasty. This pyramid and its surrounding complex were designed by the architect Imhotep, and are generally considered to be the world's oldest monumental structures constructed of dressed masonry.

The ancient Egyptians built pyramids as tombs for the pharaohs and their queens. The pharaohs were buried in pyramids of many different shapes and sizes from before the beginning of the old kingdom to the end of the middle kingdom.

There are about eighty pyramids known today from ancient Egypt. The three largest and best-preserved of these were built at Giza at the beginning of the Old Kingdom. The most well-known of these pyramids were built for the pharaoh Khufu.

Roman Engineering (Colosseum):

As we mentioned before another ancient and very successful engineering is the roman engineering. Romans are famous for their advanced engineering accomplishments. Romans were successful in many different kinds of engineering. Here we can involve aqueducts, bridges, damns, roads, military engineering and architecture. We prefer to talk only about the Colosseum which is one of the best buildings that improve that roman engineering was very successful. Colosseum is an elliptical amphitheatre in the centre of the city of Rome, measuring 188m by 156m and reaching a height of more than 48 meter and it is considered as one of the greatest works of roman engineering. The Colosseum could accommodate some 55,000 spectators who could enter the building through 80 entrances. The Colosseum was covered with an enormous awning known as the velarium. This protected the spectators from the sun. Colosseum was used to entertain the public with free games. Those games were a symbol of prestige and power and they were a way for an emperor to increase his popularity. The Colosseum was used to host gladiatorial shows as well as a variety of other events.

Greek Engineering (Amphitheaters):

To finish with the third but not the less important ancient Engineering we must talk about the Greek Engineering. It is a special Engineering and the characteristic buildings of that engineering are the amphitheaters of Greece. An amphitheatre is an open-air venue used for entertainment and performances. An ancient Greek Amphitheater was the theater Greeks performed on. Amphitheaters were built into a hill to make a sloped seating arrangement that without the Greeks originally knowing had caused an amazing type of sound filter that bounced sound even to the back row with great clarity of the actor's voices and noises. Every play that was held would be paid by a Greek Aristocrat or rich person. They would not be reluctant to pay for it because they believed it was a great honor to pay for it. People that had enough money to pay for tickets to watch the show would have to pay, but people that did not have enough money were let in free, because of how important the Greek Theater was to Greece.

The present of Civil Engineering

Modern Technologies:

We are in 21nth century and we are conscious that we are living in a modern time, where modern technology is used. By this modern technology civil engineers are making great things, great buildings, roads, tunnels, bridges, water supply, and sewage systems. Background knowledge has enabled people to create new things and makethe history of technology as the history of the invention of tools and techniques which is very similar in many ways to the history of humanity. In ancient times people constructed by using gypsum, clays, and bitumen which required too much heat in order to become effective. Nowadays composite materials, plastics, and ceramics have been the dominant developing materials used by civil engineers. Some of the modern composites are:Asphalt,Concrete, Transparent Concrete, Pomp which pump the concrete in high buildings, etc...Civil engineers use asphalt for the construction of pavement, parking lots and highways. Concrete is also a very useful composite for pavements, building structures, foundations, roads, over-passes, bridges, parking structures, block walls. Some other modern materials that are used nowadays all over the world in civil engineering are: Klindex, automatic rendering machine, Vacuums etc.We have also transparent concrete by which civil engineers are making great buildings especially in Dubai. By these materials civil engineers are building great things like skyscrapers, tunnels, highways, span bridges, etc. Albania also is being part of the evolution but it does not have the potential to build great things like big countries as USA or Dubai. Albania was isolated for four decades when communism was part of us, without any opportunity to see how other countries were living, how fast technology was improving there, so we are too late in time in comparison with other countries. Albanian civil engineers are giving their best in order to build something special, new, and modern for Albania, but the problem is the budget because Albania does not have so much potential in order to sponsor them. But this doesn't mean that Albania will stay in this situation forever, because if we all try and work hard something new can be achieved. As the time passes we hope to see Albania considered as a modern country with the best civil engineers!

Skyscrapers:

A skyscraper is a tall building usually designed for office and commercial use. There is not any limit of height from which a building can be classified as skyscraper. A skyscraper may be also a relatively small building which protrudes well above its built environment and changes the overall skyline. The first skyscraper was the Home Insurance Building in Chicago. A famous structural engineer Fazlur Khan said the great idea of constructing skyscrapers by the "tube" structural system, including the framed tube, trussed tube, and bundled tube, in the early 1960s.The advantage of these systems was the great economic efficiency and also the various shapes of skyscrapers. By his ideas over the next fifteen years many towers were built, like the "Second Chicago School", including the massive 442 m, Willis Tower. In the intervening time 2000, Cities like Shanghai, Dubai, New York, and Toronto etc., have qualified a huge swell in skyscraper creation, Hong Kong, and New York City, Chicago or else known as "the big three," are familiar in architectural circles as having particularly fascinating skylines. Skyscrapers are very helpful for countries that have a big number of population because in a small are can live a big number of people. Countries like China or India need skyscraper too much because they are places with a very big number of populations. They also help countries which are small in area and don't have land to build too many buildings. But they are also built for economic reasons; because there are places where land is very expensive as in the centres of big cities but they provide such a high ratio of rentable floor space per unit area of land. But the problem of them is that they need too much

potential to be built, and countries which don't have a good economy, like Albania, cannot build them. Albania is a small country with a small potential in economy which provides it to build these great buildings like skyscrapers. Albania is a country with small number of population which means that Skyscrapers are not too much needed. Skyscrapers are considered symbols of a city's economic power; they also help to define the city's identity.

Transportation:

Transportation is the movement of people, animals and goods from one place to another. Transportation is helping us in tourism, in movement of people in different countries, movement of products etc. By this movement information, ideas, different technologies are exchanged between different places or countries and the result of this exchange is a better life, a better technology. Transportation of passengers may be public, where people provide scheduled services, or private. Time or world in which we are leaving is impossible without transportation. Modern infrastructure or massive production wouldn't exist if transportation was useless. The global society would not have experienced comfort and convenience without transportation. Transport is important since it enables trade between peoples. Ways of transportation include air, rail, road, water, cable, pipeline, and space.

Modern transportation is also being part of our country, Albania. Some ways of transportation in Albania are: air, rail, water, road, etc. One of the most important modes of transportation in Albania is air travel, and is an important part of our economy. "Mother Teresa" International Airport is the only airport of our country; it is located in Tirana capital city, just 15 minutes away from the centre of the city. Rail is also a well-developed network in Albania. There are train services from the capital city of Tirana to places like Fier, Ballsh, Shkodra, Vlorë and Pogradec .But as time passes these rail networks are being damaged and government is doing nothing in order to repair them. One of the major modes of transportation in Albania is road network. Most of the cities and provinces are connected by bus roads. Water is also an important part of transportation which is almost realized by ferry services. By using these ways of transportations Albanians can move in different countries, cities for different reasons like: work, exploring, health reasons, etc. .But these are not enough for Albania, because like everywhere else Albania is being part of the chaos of transport. Some of the roads have been damaged as the time has passed. Albanian civil engineers in collaboration with the foreign ones are making new projects in order to avoid chaos in Albanian cities. As an important project that we can mention is Bechtel and joint-venture partner Enka which put Albania in the fast lane in 2010 with the completion and opening of a $535 million modern motorway. The Albanian motorway is one of the main ever-infrastructure projects in the country and presented many engineering challenges because of geological complications in the region and the fast-track construction plan. The motorway includes a 3.4 miles twin bore tunnel and 29 bridges built in a mountainous, rocky section. Another important project is the road which connects Tirana and Elbasan cities. In order to put down the chaos Albanian government is thinking to build new roads, tramway (in Tirana capital city), tunnels, etc. These kinds of problems will exist even the time passes, even the technology will improve but we expect that future civil engineers do something more effective for these types of problems that are distressing our society.

Smart Houses:

The future of civil engineering relays definitely in the most modern technologies; artificial intelligence, touch screen input method and solar power usage. Using these three elements, civil engineers have created the so-called “smart” houses. These buildings, incorporated with the above mentioned elements, make them very useful, easy and practical to use. The main purpose of the smart houses is to save as much energy as possible and to be economical at the same time.

One of the main problems is the energy loss. 75% of the home’s heat is lost through the walls and the roof. Thus a new European plan to build design homes that are much smarter about energy use is being made. A typical U.S. or European household consumes around 13,000 kilowatt-hours of energy per year on space heating. A number of building designs have been put forward that cut this and other home energy use to nearly zero, but only a few of the houses have been built.

The reason why there aren’t many smart houses is their price. Due to the use of expensive technologies, their price is quite expensive itself. But the Smart Energy Home initiative hopes to avoid these market failures by taking a broader approach that does not rely on expensive stand-alone technologies.As part of the initiative, BASF and a number of other companies, including Spanish construction firm Acciona, recently formed a consortium to bring energy-saving technologies — such as insulation, home sensors and co-generation — to market. They have plans to build at least six demo homes in various European cities.The exact configuration and look of future smart energy homes is still not completely decided. They will likely have a lot in common with "passive" houses. First built in Sweden, passive houses use a high-standard of insulation and air-tight construction. Incoming air is pre-heated by underground ducts that exchange heat with the soil, and windows and walls are carefully placed to maximize the use of sunlight. By retaining its own heat, a passive house requires no more than 15 kilowatt-hours per meter-squared (1.5 kilowatt-hours per square foot) of external heating per year, which is about 10 times less than the current European average. Passive houses cost roughly 20 percent more to build than other houses, said FabrizioCavani of the University of Bologna in Italy. He thinks they will remain a small niche of the market until the price drops to within 10 percent the cost of normal houses.

"The main resistance to everything is the cost," Cavani said at the ESOF meeting.

The Smart Energy Home initiative aims to incorporate existing technologies into a more marketable and cost-effective package. One of the main objectives will be improving insulation, as this is an easy way to reduce energy consumption.

"Insulation pays off if you are a smart user or not," Iden said.

Globally, insulation improvements could annually save more than $100 billion, according to a 2007 report in the *McKinsey Quarterly*. And this would come with a reduction in more than a billion tons of CO2 emissions per year.

If Dubai is considered a modern country, what will it be considered after 100 years?

Dubai is the city that definitely looks nothing like any city anyone has seen before. The citydoesn't do anything on a small scale. They are currently in the process of building the firstunderwater hotel, and the houses at their marina are not only modern, but the design used to buildlooks like something straight out of the *Waterworld*. Add the unusually shaped buildings and busy city life, and you could definitely be looking at our future. They have one of the world's first ever built 7 star hotels called Burj Al Arab Hotel.

Dubai is nowadays considered the most modern city in the world, because it has the most modern buildings in the world currently. All this is achieved by the great profits that the oil company gives, and also by the tourism. Since the oil in our planet is on its lowest limits, oil industry is destined to collapse. Thus, if the oil industry collapses, we can presume that Dubai's economy will also fall drastically. In the next 100 years, oil industry will already have collapsed, so I don't think that Dubai will still be a modern city after 100 years.

Does Albania have the same potential to become a modern country like Dubai?

Albania is currently not a very powerful country economically. But it has the potential to be a modern city, although maybe not as powerful or advanced as Dubai currently is. A good resource management, good political guidance and also a good foreign policy can make Albania a powerful country because Albania has plenty of natural resources and has a strategically good geographical position. With little help Albania can become a modern city and can compete with other powerful countries in Europe.

Civil Engineering in Albania

What can Civil Engineering do about Albania?

Albania is a country with many problems in infrastructure, transport and urban planning. Civil engineers are the people who have the power to change everything. This change can begin by implementing new technologies such as transparent concrete, Klindex etc.

Most of the European standard rules of construction are not followed especially in the rural areas. This cause urban chaos in most of villages, and even in the suburbs. Transport in Albania, is a problem that needs attention. Public transport in Albania is a real problem that we face day by day. One of the solutions that we as future civil engineers propose is the construction of a interurban subway.

Will it make life easier or more complicated?

Surely it would make life easier! Many civil engineers are working hard to make our lives easier and more comfortable. We, as future civil engineers, are also thinking of that.

What can civil engineers do about the urban chaos in Albania?

Chaos in Albania is caused by four main reasons which are:

a. Roads
b. Traffic Lights which don't function properly
c. Absence of proper public transport
d. Absence of new ways of transportations (subways or tramways)

The main problem to solve in Albania is roads. Fixing them would lessen the urban chaos especially in big cities like Tirana or Elbasan. They also decrease the numbers of accidents

which are great in Albania. Also another cause for accidents is traffic lights. Traffic lights in Albania are a system that has many malfunctions. Most of the cities in Albania have no traffic lights system, and believe us, this is a big problem. Investing in new ways of public transport such as subways or tramways is a good solution for everyone.

CONCLUSION

Civil Engineering was important since its creation along with other disciplines. This discipline deals with solving everyday problems and making our lives easier. Since ancient times, civil engineers have worked hard, with difficult calculation to make monuments and structures which would solve their problems, like palaces or even dams. Even today civil engineers struggle to find new and better solutions to such problems as overpopulation or transportation.

REFERENCES

Reference numbers in the text should be designated by square brackets, e.g., [1-3]. The references should be listed in the same order as cited in the text. See also examples in the REFERNCES section of this template [1-3].

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