

Building an empire:

[History](#), [Empires](#)



Building an Empire: Engineering Marvels of the Roman Empire “ Imperium Romanum”- Latin, the Roman Empire. At the height of their civilization the Roman Empire controlled over 2, 300, 000 square miles of territory that spanned through the continents of Europe, Asia and Africa. At the heart of the empire was the great city of Rome. A modern day New York, Rome boasted many incredible landmarks. Here was located the great Coliseum where many gladiatorial games were held for the entertainment of the roman citizens. Here also was the Circus Maximus. This remarkable stadium held chariot races that could rival modern day NASCAR. All over the Roman Empire one could find the many remarkable engineering feats of the Romans. Whether it is the ingenuity of the Aqueducts or the remarkable stadium designed to seat 70, 000 people comfortably, the Romans were by far the top engineers of their times. Since the Roman Empire was so incredibly large, they needed some creative ways to solve the problems that can face any empire or city. Their citizens needed food, water, transportation, money, housing, and entertainment. The Romans methods of solving these problems were absolutely brilliant. The first and most basic need that needed to be solved was water, and the Romans resolved that problem with ease. The solution they found was the Aqueduct. The Roman Aqueducts were astounding pieces of engineering. The Aqueducts frequently used the arch in their construction. The arches made them capable of spanning large gaps in the landscape as well as give them added support. These systems were capable of transporting water from over 50 miles away into a city. At the height of the Roman Empire, there were over 200 cities that had their water supplied by aqueducts. Rome itself had 11 separate

Aqueducts leading into the city. The longest one, the Aqua Novus, stretched from 59 miles away into the city. At the climax of the Roman Empire, the city of Rome had approximately 1, 000, 000 citizens. With such a large populace the demand for water was extremely high. Even with those large demands the Aqueduct system was still able to perform. It delivered a stunning 1 cubic meter of water per person. This amount is more than is available in most modern day cities. This water was used for daily life and Rome was even equipped with its own working plumbing system. Another great feat of accomplishment for the Romans was the public baths. These baths were fed water by the Aqueducts and were available to all roman citizens. The greatest of these baths were the Baths of Diocletian. This complex could contain 3, 000 bathers at one time. They were built in such a fashion that the sun would heat the baths and keep the water warm throughout the day. The baths were only able to exist because of the Aqueduct system (UNRV History of Aqueducts). The engineering marvels did not end there. The empire needed resources such as gold and silver. Their unique and creative mining techniques and tools were truly engineering marvels. Throughout the Roman Empire there was plenty of land with abundant mineral resources. The Romans knew this and so they needed to find a way to excavate that material. To do this they developed certain systems of mining and unique tools to accomplish the job. For surface mining, that is mining with the exposed veins on the surface of a rock face, the Romans would use their aqueduct system in a unique way. They would run the water from a nearby stream using the aqueducts and flush away all the loose soil and rocks thus leaving the veins exposed and ready for mining. They would then dig small

tunnels at the surface and strip mine the rocks. The Romans also implemented the Archimedes Screw into their mining projects. They would use the screw to remove excess water that was in the tunnels. Another technique that the Romans used was called strip mining. This was an extremely dangerous and risky endeavor and was only used for extremely precious metals such as silver or gold. The way this was done was to dig a large shaft straight down from the top of the mountain. When any veins were found, horizontal shafts were then dug. You can guess the problems that the Romans faced while doing this. There was poor lighting in the tunnels and also there was water in the tunnels (Lynne Cohen Duncan). Even in spite of these obstacles the Romans prevailed and their empire was rich in precious metals. But what good is money if it had no use? The people of Rome needed entertainment and the Roman engineers were up to the challenge and had the riches of an empire at their disposal. Because of the many ingenious techniques and solutions the Romans created, their empire left a lasting legacy on the world. Although the Romans may not have invented all new materials, they found extremely unique and brilliant ways. Their systems and accomplishments made their empire a long lasting one. Their marvels still can be seen today and it is unknown how long the future will hold them for many more to see.