Hoover dam essay

Hoover DamThe Hoover Dam is one of Americas greatest civil engineering marvels (Hernan 22) and has become a magnet to those fascinated by human ingenuity at its best (Haussler 30). With its enormous size and construction during the Great Depression, it was an interesting topic to me. I would like to major in civil engineering and, at first, I was researching this topic. I was looking for salary and job descriptions. Then, I discovered the name John L. Savage, the engineer who supervised the design of the Hoover Dam and many other dams in the United States. Savage worked on the Minidoka irrigation project in Idaho after joining the United States Reclamation Service in 1903. His future of building dams first began " When I first went out to the Snake River Valley, he said, I saw only a river and a lot of wasteland. After the dam was up the land changed. It got water. Farmers moved in to work the soil. Crops grew. Then came villages and towns. That's why I think this is the happiest, most thrilling work in the world (qtd. in McCann). The characteristics he describes are evident to me, as well as other people in this field. All of the great buildings and projects of the World were overseen by civil engineers. These water resources projects, such as the Hoover Dam, not only disturbed the flow of rivers but created towns, industries, and even developed a desert region. Unfortunately, the dams can also cause adverse effects.

The Colorado River may have been too thick to drink and too wet to plow (Boris 4) but, it was not too strong to dam. The Boulder Canyon Project was first conceived in 1928 (Wassner 98) and was approved for flood control, storage of the Colorado River water, and the production of hydroelectric power (Hoover Dam – FAQs). John R. Hall explains that the Hoover dam was

built to harness the awesome power of the Colorado River (22). The Department of Reclamation had a huge task on their hands when supervising the construction of the Hoover Dam (Hall 22), previously known as Boulder Dam and changed to Hoover Dam for President Herbert Hoovers strong support of a Dam on the Colorado River (Wassner 97). First, before even breaking ground, there had to be away to easily access the dam site and house the six-thousand workers who will build the great dam. Boulder City was created to house the Government and contractor employees, a twenty-two foot wide highway was built to connect with the dam site seven miles away, and Union Pacific railroad built a railway stretching almost thirty-three miles from Las Vegas to Boulder City, and then to the dam site. The construction would also need electricity so two-hundred and twenty-two miles of a power transmission line was constructed from San Bernardino, California to the dam site. Now that there was a system of transportation and living, the dam site needed to be prepared and have materials brought in (Hoover Dam – FAQs). First, a dam cant be built with the river still flowing; diversion tunnels were created that were four-thousand feet long (Wassner 98) and fifty-six feet in diameter (Gorum). These alone took two years to build and had to be done during the winter due to the force of the rapids of the Colorado during warm weather. After the river was diverted, it left behind stinking muck. This consisted of two million cubic yards of mud and silt. The residue was hauled off exposing the bedrock of which could support the dam (Wassner 98). There was no construction company around that could raise enough money for the performance bond, so six companies combined to form Six Companies Inc. (1936: Hoover). In order to support the demand of the materials for the construction of the dam, steel and aggregate plants

were also created (Dam one of). The railway set up before construction, as well as dump trucks were used to haul these materials and other materials to the dam site (Hernan 22). The arch-gravity (The Hoover Dam) Hoover Dam consists mostly of concrete; some 3. 25 million cubic yards of it making it impossible to pour the structure in one sitting (Wassner 99). There were three factors making this impossible: a lot of concrete, the massive size of the dam and the heat of the concrete. The dam demanded a huge amount of concrete that no one company could have met. As a result, a few concrete companies were built near by just for the construction of the dam. Barrels were used along with railroad cars to transport the concrete to the dam site (Hernan 23). The barrels were then picked up by invented cable system made specifically for the damn and dumped eight cubic yards at a time (1936: Hoover). This cable system allowed for the barrels of concrete to be hauled down into the canyon in which the dam was being built. Because of its humongous size, this is also how the workers and other materials were transported down to the bottom of the canyon. According to Cecilia Wassner, Hoover dam is seven-hundred and twenty-six feet tall and six-hundred and sixty feet wide at its base and only forty-five feet wide at the top (99). The dam is also twelve-thousand, two-hundred and forty-four feet long. A form could not have been built to house the dam while the concrete set for it to be poured in one continuous run. Instead, the dam was built twenty-five by five foot blocks at a time. In order to make the dam be one big unified structure grout was placed in between the cracks of these segments (Sevastiades 17). The smaller segments were built mostly for the cooling of the concrete. If not for that factor the dam would have most likely been poured in larger segments. With a total of 3. 25 million cubic yards of concrete in the dam it

would have taken two-hundred years to cure. Instead, a refrigeration process was created (Hall 23). This process took just one year with the new cooling method the innovative engineers thought of. While pouring the concrete in the dam one inch pipes were placed five feet apart to remove any heat over 72aF. In total, five-hundred and ninety-two miles of pipe were used during the construction consisting of five-thousand and eighty coils. Four hundred electrical resistance thermometers were also used in the placing of the concrete so the temperature could be monitored. A refrigeration plant and seven story cooling tower were built eight-hundred feet from the damn capable of producing one-thousand tons of ice every day. Four gallons of cold water were pumped through the damn from these facilities every minute (Hall 25). The completion of the dam took just five years; two years ahead of schedule. Throughout this time sixteen-thousand men worked on the dam. There was approximately three-thousand at any given time. The construction was completed in shifts running twenty-four hours a day every day except Christmas and Independence Day. With the dam site located in the desert temperatures could soar into the 140s (Hernan 22). The men had a hard, dirty, dangerous job, and their pay reflected that. Their salary was extremely high for that time period. They made five dollars per hour. Although it doesnt seem a lot these days it was more than four times the average wage at that time (Wassner 99). After the dam was complete the Colorado River water was allowed to flow like it originally did with only one problem. Now there is a 6. 6 million ton dam in its way (Hernan 23). When the river started flowing again, Lake Mead, Hoovers reservoir, began to appear. This lake, named for Elwood Mead, Bureau of Reclamation Service Commissioner, stretches one-hundred and fifth teen miles upstream from the

Hoover Dam and it holds 28. 5 million acre-feet of water. Imagine a football field filled to a depth of one foot. Now multiply that by 28. 5 million. This is a lot of water (Wassner 99). So much water it would take six weeks to empty. Enough water for 20 million people and provides irrigation to 1. 5 million acres of land (Gorum). Astoundingly, it took the reservoir six and a half years to completely fill (Wassner 99) holding two years of the Colorado River (Dam One Of).

With Hoovers seventeen generators and extremely large water supply, cities were able to grow very rapidly. The hydroelectric turbines produce four billion kilowatt hours of electricity per year. According to the American Society of Engineers, the dam has had a huge part in the development of the southwestern United States (American Society). It has stopped flooding, provided water for human consumption and agriculture, and supplied electricity to three states, according to Wassner: Arizona, Nevada, and California (99). Amazingly, power hungry Las Vegas only receives one percent of the power from Hoover Dam. For having such a great impact on the lives of Americans the American Society of Civil Engineers honored the Hoover dam as the Civil Engineering Monument of the Millennium. Written on September 27, 2001 the article states The new millennium reminds us of the tremendous impact civil engineering has had on the development of our society . . . It is fitting that the Hoover Dam would be chosen by ASCE for this special honor. The dam ushered in a new era of confidence in the design and building of great water resource projects (American Society).