



ENGINEER PROFILE

Name: Hemang Desai

Organization: Santa Clara Valley Water District

Engineering Discipline (Check one below):

- Civil
- Mechanical
- Electrical
- Environmental (including Process)
- Structural
- Information Technology
- SCADA
- Other

1. Please describe the work you do:

I plan, design and manage raw water storage and supply facilities such as pipelines, dams and reservoirs. During the course of my work, I produce decision reports, design calculations, technical memorandums, and, construction documents i.e. plans, specifications and cost estimates.

2. What combination of education, experience, and skill was required in order for you to obtain your job?

A Bachelor's degree in civil engineering is the minimum education required to successfully perform my job. A Master's degree with emphasis in structural, geotechnical, or construction engineering could be invaluable. Five to ten years of experience working on various heavy civil engineering projects is a must. The experience should include working on various phases of the projects including planning, design and construction. During the course of a project, a number of engineering and monetary decisions have to be made in short time and with meager data. At a minimum, skill in identifying, organizing and analyzing data to solve complex, multi-constrained problems is needed to perform my work. People and communication skills are helpful.

3. What do you like best about your job?

I like the satisfaction of solving complex problems and the sense of creation when the solution is implemented through construction. It also feels good to know that the completed project will be beneficial to the public and the community.

4. Please tell us about the water or wastewater engineering project you enjoyed working on the most, and what made it rewarding,

I was a part of the team which recently replaced the old outlet works at Lexington Reservoir. Lexington Reservoir is one of the ten dams owned and operated by the Santa Clara Valley Water District. The outlet works of a dam is a critical appurtenance as it not only releases operational discharges but also facilitates evacuation of the reservoir during emergencies. The old, 410 cubic-feet-per-second (cfs) capacity outlet works was not functioning as intended and was replaced by a more reliable outlet works consisting of a multiport intake structure; an outlet conduit within an access tunnel; and, an outlet structure with control valves, flow measuring devices, and energy dissipaters. Innovative and creative ideas were used by the team to solve complex problems related to tunneling; hydraulic design of the intake and the dissipaters; and, the construction sequencing. The project was constructed within two years for a cost of \$60 million. Knowledge obtained during the design was shared with other engineers through publications and presentations. The project was awarded with "The Best Large Project of the Year in the US" award by American Public Works Association.

5. What qualities and capabilities are needed in order for an engineer to be successful in the water/wastewater industry?

At a minimum, a civil engineer should be able to collect, organize and analyze complex inter-dependent data. Civil engineers are constantly tasked with solving intricate problems with multiple possible solutions. Usually, these solutions have to be developed quickly with incomplete data. A civil engineer should be able to use his or her judgment to recommend the most optimum solution. In addition to technical capabilities, a civil engineer should be an effective communicator and should be good at working in large multi-disciplinary teams.

6. Do you have any advice for an individual who is considering pursuing a career as an engineer in the water/wastewater industry?

Majority of the infrastructure in the United States was built right after World War II. Much of this development has reaching its useful life. Increase in demand for water and decrease in reliability of the existing infrastructure has made civil engineering a very attractive career, especially for those who want to utilize their knowledge and skills to solve complex problems.