



Foreign Engineering Graduates in America

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America is a nation built by immigrants. The United States accepts approximately 1,000,000 legal immigrants per year. The U.S. is the most welcoming of all countries and a primary destination for foreign migrants, more than the other top five industrialized nations' immigration rates combined (Germany, United Kingdom, France, Canada, and Switzerland).

One source of U.S. immigration is through an influx of foreign graduates. However, there is a misconception that foreign graduates are impacting the engineering profession negatively and costing U.S. tax dollars. The focus of this article is to open

a dialogue on this sensitive topic, share some facts on the numbers/scale of foreign engineering graduates, and examine the national immigration debate as it relates to the engineering profession.

There are several avenues for a foreign graduate to obtain work in the U.S. I am a product of U.S. immigration policy, as my parents came to the United States from India in 1968 when I was only three years old. My parents arrived with \$1,500, no car, and no job, but with admissions to the Masters Program at California State University, Fresno, where they both completed Masters Degrees and became teachers.

Migration to the United States has only intensified since that time. A few statistics are important in putting immigration and how it relates to the engineering profession into a perspective of scale. The current U.S. economy consists of a \$20 Trillion G.D.P., with approximately 157 million workers in a total population of 310 million. The Civil Engineering population totals roughly 255,000, with approximately 100,000 Licensed Professional Engineers (PEs) in all 50 States and 10,000 registered Structural Engineers (SEs).

One avenue for foreign engineering graduates to obtain work in the U.S. starts with an employment period via the H-1B program. Established in 1992 for highly skilled/educated professionals, H-1B often leads to permanent immigration status and eventually to U.S. citizenship. The program assists employers seeking to hire nonimmigrant aliens as workers in specialty occupations; as such, the H-1B Visa is targeted to Engineering, Computer Science, Scientists, Doctors, Researchers, and other highly qualified talent. Congress sets the quota at about 85,000 annually (of which 20,000

are reserved for Masters Graduates). There are approximately 450,000 applications each year, which overloads the U.S. Citizenship and Immigration Services (UCICS) website within 3 days of the annual application date. Lottery luck dictates those accepted for H-1B status. From these 85,000 H1-Bs, the vast majority are in Computer Science, Information Systems, and Software Development. In fact, the foremost proponents of the H-1-B program are Microsoft, Facebook, Apple, and Google, who sponsor the highest number of applicants.

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In terms of Civil and Structural Engineering, the H-1B applicant pool is very small (less than 1,000 based on available USICS Data). The overall impact on the employment market is a trickle when compared to the total employment of 157 million U.S. workers. Likewise, the economic impact for the structural engineering profession is minimal due to the low numbers admitted compared with the size of the industry.

One myth prevalent in the engineering industry when it comes to foreign engineering graduates is related to salary. H-1Bs are often and incorrectly viewed as accepting lower pay than their American counterparts. From my own experience, having sponsored H-1Bs in my company over the past 15 years, I can attest that this is a falsehood. The H-1B program was explicitly set up to protect both U.S. and H1-B workers. Employers must attest to the Department of Labor that they will pay wages to the H-1B nonimmigrant workers that are at least equal to the actual wage paid by the employer to other workers with similar experience and qualifications, or the prevailing wage for the occupation in the area of intended employment – whichever is greater. As such, the paperwork and plethora of reporting often make hiring H-1B workers difficult for small businesses. Large employers sponsor H-1Bs because they are generally Masters/ Ph.D. graduates with specialized training/education that can be difficult to find among the local population.

Visit a University Engineering Graduate School and you will find a majority of international students. In fact, many Ph.D. engineering students are foreign applicants that arrive on Student Visas and eventually seek to stay through the H-1B program. The H-1B provisions intend to help employers who cannot otherwise obtain

needed skills and abilities from the U.S. workforce by authorizing the temporary employment of qualified individuals. Certainly, a preferred solution to filling specialized engineering positions would be to encourage our own citizens to pursue advanced degrees and specialize in technical topics. Unfortunately, the data shows that there is no shortage of homegrown American talent for Construction Management, Project Management, Executive MBAs, and Hedge Fund Managers. Conversely, numbers are very small for homegrown talent pursuing a Ph.D. in

Nonlinear Finite Element Analysis of Rubberized Concrete, Dynamic Soil-Structure Interaction, or Nonlinear Dynamic Response of Performance-

Based High-Rise Buildings to Seismic ensemble excitations using the Power Spectral Density Method.

In the meantime, Foreign Engineering Graduates help to fill a void of expertise, positively impacting the engineering community.

In summary:

- 1) The impact of foreign graduates is minimal on the total U.S. Economy and minuscule on the Civil and Structural Engineering Industry.
- 2) Incoming graduates run research programs and contribute positively to the economy by providing specialized expertise that currently does not exist in the U.S.
- 3) Foreign Engineering Graduates do not cost more, and they specialize in areas that are least pursued by our own citizen engineering population.

In the end, remember that foreign graduates eventually become taxpayers and contribute significantly to our economic growth. It would be unwise to lose their financial contribution and intellectual investment in our society.■

Statistics cited in this article were obtained from U.S. governmental data (USICS and U.S. Department of Labor) and industry organizations (ASCE, NSPE, NCEE, NCEES).

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