

INDUSTRIAL ENGINEERS ARE GEARING UP TO SUPPORT LEAN CONSTRUCTION

The Institute of Industrial Engineers (IIE) is the world's largest professional society dedicated solely to the support of the industrial engineering profession and individuals involved with improving quality and productivity. Founded in 1948, IIE is an international, nonprofit association that provides leadership for the application, education, training, research, and development of industrial engineering. IIE has several membership divisions, including: Process Industries, Applied Ergonomics, Quality Control & Reliability, Operations Research, Health systems, Construction, Engineering and Management Systems

The Construction Division was established about 5 years ago to promote the application of IE techniques in the construction industry, and now has over 500 members. The division aspires to help in improving productivity and quality in a manner similar to their contribution in other industries. IEs started out in the manufacturing arena and then spread to the services sector. They have helped the food service industry to produce consistent quality at high volumes, the health care industry enhance quality and reduce errors, and package delivery companies gain a competitive edge.

Frank Gilbreth is recognized as an industrial engineering pioneer; he built on Frederick Taylor's Scientific Management concepts to develop a discipline that evolved into the modern field of Industrial Engineering. In his early work he studied construction – specifically how to speed up bricklaying. He analyzed bricklayers' procedures and reduced their motions from 18 to 5 or fewer, with a massive increase in productivity. Despite Gilbreth's early contributions, IEs have not focused on the construction industry. Given that industry's notoriously high level of waste and low productivity there now is an opportunity for IEs to contribute to the work of construction professionals and researchers who seek to improve construction performance.

With that objective in mind, the Construction Division advances the adoption of industrial engineering techniques in the construction industry through interdisciplinary research, collaboration, and partnership with related professional organizations, suppliers, and research organizations. The Division promotes lean construction to eliminate waste and develops strategies to continuously improve construction competitiveness, value, safety, and stakeholder satisfaction. It supports its members through continuing education, conferences, seminars, publications, and networking activities to advance their knowledge base and empower them to influence positive changes in the industry.

Examples of our activities are:

- In each year's annual conference the division manages two construction tracks – a Solutions (practice-oriented track) with papers on construction performance improvement, and a second track with research papers.
- There is a sponsored award for a student "best paper" on IE applications in construction. The winner receives \$2,500, including travel costs to the conference to present a paper
- A newsletter is published several times yearly – it can be accessed at the website www.iieconstruction.org
- An "Ask the Expert" program through IIE provides readers with advice on construction-related issues.

IIE and LCI have had an informal collaboration for a while and it is growing in scope. LCI members have presented papers in IE conferences, and IIE members have been attending LCI conferences. IIE members plan to support the development of LCI chapters based on their location.

Professional Overview:

Not everyone is clear on what IEs do – they are mistakenly identified with manufacturing activity, which is only one facet of their professional reach. Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment, and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design, to specify, predict and evaluate the results obtained from such systems. Anecdotally, other engineering disciplines make systems, while industrial engineers “make systems better”.

What are the traits of industrial engineering that it can contribute to the construction industry? IEs are multi-skilled and multi-faceted as a result of their training. They have a solid foundation in engineering principles, and very importantly, they are generally more oriented to the human element than are other branches of engineering. As we all know, design and construction projects can only be successful when all the parties work together harmoniously, and it is quite a challenge to orchestrate these complex activities. IEs are trained as systems integrators and lean facilitators, so they can help the involved parties to work together for maximum effectiveness. IEs are also very concerned with improving quality and performance overall, and have the tools to reduce errors and the resulting financial waste that end up as a cost to society.

For more information on the Division, please visit the website www.iieconstruction.org.

Lincoln Forbes, Ph.D., P.E.
Division President, IIE