

COMPANY OVERVIEW



COMPANY WEBSITE
www.mercuryeng.com

Mercury Engineering, founded in 1972, continues to operate as an entrepreneurial Engineering Contractor with three guiding principles: Safety, Quality, and Delivery. This has been the cornerstone to being the most successful multi-disciplinary engineering contractor in every sector and geographical area in which we operate. Headquartered in Dublin, Mercury deliver complex engineering projects across various sectors, including Data Centres, Hyperscale &

Enterprise, Life Sciences, Healthcare, Fire Protection, Building Services, and Technical Support. Mercury employ over 3,000 employees across Ireland, the UK, and Europe, and has an annual turnover of €700M.

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OVERVIEW OF THE LEAN INITIATIVE

Those familiar with Lean principles will know the seven wastes, and the focus in this Lean project was on finding and eliminating invisible wastes. Inventory, Defects, and Over-Production are wastes that we readily identify with and can spot quite easily; however, Transport, Waiting, Movement, and

Over-Processing can be harder to spot. These can be described as the “invisible” wastes. Our goal for this project was to identify and eliminate these invisible wastes by applying the DMAIC methodology: Define, Measure, Analyse, Improve, Control.

BACKGROUND TO THE LEAN INITIATIVE

In 2014, Mercury was working with a very well-known large semiconductor manufacturer installing tools for their production process. We had the twin objective that all contractors face: delivery on time for the Client, and make a margin for our company. We were having problems delivering on both of those objectives and we needed a new way forward. We chose to apply the DMAIC approach to our situation. Our work was being undertaken in a highly congested and complex environment that presented the team with some significant challenges. The team as a whole had already embraced Lean Construction and were familiar with the principles of the seven wastes. Several of the seven are readily visible, but what we needed to do was to find and eliminate the invisible wastes. We defined our challenge as being to “Identify and Eliminate Invisible Wastes”. With this in mind, we decided to undertake some direct observation. This is a very powerful tool in the Lean Construction armoury and can help to identify all sorts of wastes, but it

must be done with a huge degree of cooperation from all involved. It is then crucial to move the opportunities quickly through the DMAIC cycle.



Figure 1. The DMAIC Methodology.

LEAN INITIATIVE UNDERTAKEN – LEAN THINKING, TOOLS, TECHNIQUES

The core foundation for Mercury on this Lean initiative was to adopt DMAIC as its core Lean approach to improvement. DMAIC ensured Mercury could make significant gains in quality, schedule, and productivity by making many small improvements over time in a continuous structured format.



Figure 2. Improvement Initiatives.

Direct observation in the field was critical to DMAIC as it allowed our team to identify the once invisible wastes such as time spent retrieving materials, setting-up work, and motion around site. Using this data, we developed innovative ways to reduce such non-value-adding (NVA) activities while in turn maximising time spent completing value-added (VA) work, for example, installing pipe, tray, and brackets. Our team of experts on site reviewed the data weekly to track, analyse, and generate improvement ideas. Using our continuous improvement approach, we strove to have everything needed to complete the task right at the workforce and to remove all obstacles impeding workflow.

Our Lean programme further instilled the mindset on site that quality on all areas of the project is everybody’s responsibility. We set up a right-first-time (RFT) indicator allowing us to accurately see any reason why something might not be installed RFT. The RFT data is analysed weekly in Pareto format and drilled into via root-cause analysis, thus giving us a clear direction to where improvements can be



Figure 3. 5S Stores.

made. This indicator is a powerful tool to have on site as improvement ideas can be identified, validated, and tracked on a weekly basis. It proved to be hugely beneficial for both Mercury and the Client.



Figure 4. Right First Time Indicator.

Mercury also committed to Lean training to develop our people with over 150 trades and 20 subcontractors completing Yellow Belt training and 6 of the project team undergoing Green Belt training to ensure all stakeholders understood Lean concepts and core tools. Lean training spans from our CEO to our crews at the coalface, with a focus of our site teams being on analysing and improving our current processes to drive continuous improvement under the direction of our Green Belt leaders and employing the DMAIC process. The crews doing the work have the best insight into how things can be improved across Labour Productivity, RFT and Quality, Design, BIM, and Fab-shop operations. We reward our tradesmen with prizes for great Lean ideas.



Figure 5. Smart Test Packs.

LEAN INITIATIVE IMPROVEMENTS & IMPACT

A key learning from the project was that without accurate and measurable data from the work area it is difficult to evaluate your efficiency and more importantly identify and validate improvement actions. The value of direct observation is that all stakeholders are provided with fresh detailed analysis that is not contested, and instead focus is placed on generating and implementing ideas that have clear metrics to evaluate their impact.



Figure 6. Black Box Delivery System.

Across the project program, Mercury implemented up to 100 actions through the DMAIC process, yielding the following improvement metrics:

- Fabrication Issues dropped 85%.
- BIM issues dropped 56%.
- Clashes in the field dropped 44%.
- It was estimated that 12-15% of spools were not installed RFT – after the DMAIC cycle was implemented that figure

- dropped to 4%.
- S/E was reduced 41% over 16 weeks.
- High Purity Installation improved by 85%.
- Line Fails reduced from 17.2% to 0%.
- Daily welding counts rose 29%.
- Mercury-made portable cut-boxes had double the output in half the time (4 times faster).
- Toolbox trolleys reduced trips to the stores by 95% (now only once a week).
- Toolbox trolleys reduced time spent retrieving materials by 42%.
- VA% achieved up to 35% of studied crews.



Figure 7. Know Your Score.

It was important that both the improvement ideas and champions were communicated and implemented across other sites in Mercury through our “This is Lean” series.