

## Company Overview | SISK | johnsiskandson.com

John Sisk & Son Ltd. (Sisk) is an innovative engineering and construction company employing over 1,800 people in Ireland, the UK, and Europe. Sisk has the track record, scale, and capacity to successfully undertake large, complex, multi-disciplinary programmes, and we are recognised by our global customers as world leaders in sustainability and safe delivery. Sisk is a progressive business and Ireland's No. 1 ranked provider of construction services. Operating since 1859, we have built many iconic buildings and landmark pieces of infrastructure. Our continued success is due to:

- Our ability to collaborate with customers and supply chain to provide technical and delivery solutions in an open and can-do way.
- Safety, innovation, quality, efficiency, and value are integral to everything we do.

We deliver projects in key sectors such as Data and Technology, Pharmaceutical and Life Sciences, Infrastructure, Transportation, Healthcare, Commercial, Residential, Retail, Industrial, Leisure, Education, Water; and Energy.

### Author



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## Overview & Background to the Lean Initiative

This Dublin city centre-based project required the demolition of an existing 12-storey commercial building with a 9-storey tower over a 3-storey basement. In its place, a new 8-storey over triple basement, 150,000sq foot office development was constructed. The overall project value was approx. €65 million, and it was a very demanding programme made even more challenging by Covid-19.

When the construction programme was first developed, a clear critical path through the substructure, precast stair and lift cores, the structural steel frame, and the façade was identified. As a result, it was necessary that the actual progress on these elements required close monitoring and control to ensure the project was delivered on programme.

Due to the large volume of materials to be installed, the planned work was broken down into more manageable and quantifiable daily outputs. The actual daily output was then recorded and tracked against the planned output to determine the programme status. Added complications brought about by Covid-19 meant collecting accurate and consistent daily data became more challenging. Therefore, a more streamlined process was required to ensure certainty when assessing the current project status.



Figure 1. Sisk Operative Scanning the QR Code

## Lean Initiative Undertaken – Lean Thinking, Tools, Techniques

### Current Lean Initiatives

Since the outset, the project team implemented weekly collaborative Pull Planning sessions in conjunction with sub-contractor supervisors to gain input and buy-in from the entire team. By depicting the master schedule in an easy-to-read 6-week look-ahead broken out into the various zones, the programme of works became more transparent and encouraged discussion and collaboration. Sectional milestones or target dates were then used to focus the team on the

most critical tasks and helped plan how we would reach those goals. Because each of the milestones was based on achieving a specific quantity of works by a certain date, elements of Takt time planning were employed to complement the Pull Plan. Using the Takt time technique of establishing a pace, or a steady planned daily output in this case, the Pull Plan became more reliable. Alongside this, we tracked the actual daily output and the reasons for delay on a whiteboard located beside the Pull Plan.

If the recorded actual outputs varied from the planned outputs, we were able to react to make the necessary adjustments by, for example, increasing resources, resequencing, or removing blockers, and then updating the Pull Plan to achieve the target date.

A prime example of this was evident during a Kaizen event that occurred during the steel frame installation. It resulted in the final torquing of the bolts being completed on windy days when the crane was not operational so that time wasn't lost as a result of the crane being winded off. This allowed the crews to be more productive when the crane wasn't operational.

While many benefits were realised from this data collection approach, as the project progressed and more trades came on board, a reduction in the level of detail, quality, and consistency in the data collection was noticed.



Figure 2. Six-Week Pull Plan

### New Lean Initiative

**Define:** During this stage of this Lean continuous improvement project, we discussed the current data collection process and why there were varying levels of detail and consistency. It was accepted that the then data collection strategy focused on lengthy non-value-adding data inputting with no owner assigned to the information flow. For example, the data was input both on the whiteboard (for communication at the weekly Pull Plan session) and the Master Excel Tracker (which we used for overall activity analysis) before being fed back into the Master Programme at the end of each week.

There was an underestimation of the time required to collect and input the data into the various trackers before filing the information away. There was also the added risk of erroneously wiping the board and losing the data before it was captured on the Master Excel Tracker.

Using Lean tools such as drawing the As-Is Process Map and SIPOC, we determined areas for improvement and settled on our goal statement: Improving the planning and tracking of progress by streamlining the data collection process and whilst also reducing non-value-adding work.

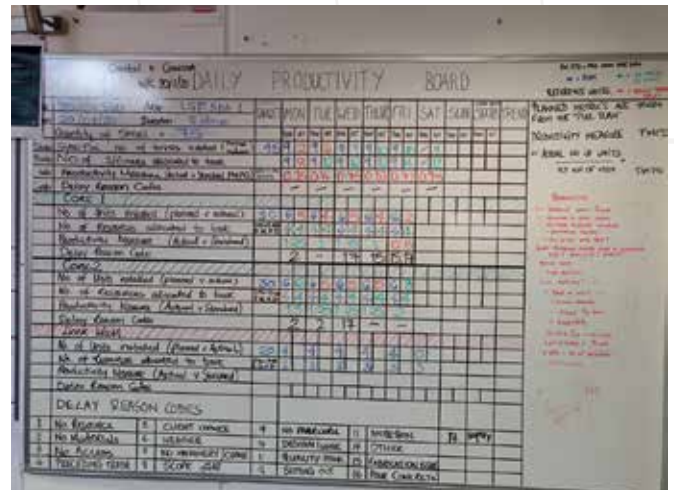


Figure 3. Daily Productivity Board

**Measure:** When reviewing the collected data, we noted several instances of incomplete information. With the complete data, we were able to compile a Pareto analysis of the reasons for delays encountered during the installation period of the key trades. This graphical analysis helped create a picture of what 'pain' we were suffering in the process. While this information is good to capture, it focuses more on a reactive approach than being proactive.

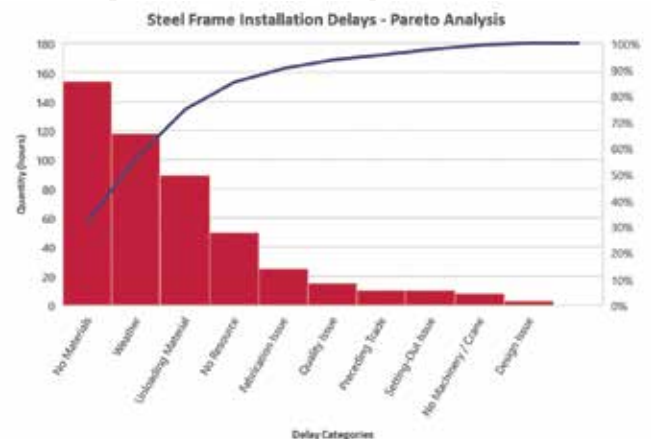


Figure 4. Pareto Chart

**Analyse:** Here we listed the probable reasons for incomplete data collection and used the Cause & Effect Matrix and Five Whys to get to the root cause. Primarily, the reasons were:

- Not understanding the benefits of data collection; and
- Not being prompted to input complete information.

**Improve:** As a group, we brainstormed possible solutions and depicted the improvement ideas on a PICK chart to gauge the potential payoff and level of difficulty of implementation. A quick and easy solution that was deemed to have a high level of pay-off was an online form that would be filled out at the end of each day by the Package Manager on-site on their mobile device. It would quantify the actual work completed that day, plus any issues ('pain') encountered, as well as planned work for the following day. This form could be accessed easily via a QR code positioned at the site exit.

We also applied Poka-Yoke for error proofing by using compulsory fields to prevent non-responses and incomplete data collection. Once submitted, the data would be instantly available for several parties to view, improving levels of communication since several members of

the project team – like the Planner and Commercial team – were working from home.

We applied the Plan Do Check Act (PDCA) cycle to the creation of a prototype form and sought feedback from the team. We then created a refined solution and tested with potential users. Following some tweaks, we standardised the form and trained participants before implementing amongst the wider team.

**Control:** To prevent people slipping back into the old way of doing things, we put a Control Plan in place to ensure the new process was executed correctly. Amongst other things, this detailed the frequency and the method of communication, how the new process would be integrated, and who would be monitoring future performance.

Finally, a Lessons Learned document was compiled to capture and share knowledge.

|       | Communicating the Results   | Integrating the New Process  | Monitoring Future Performance   |
|-------|---|--|---|
| Who   | <ul style="list-style-type: none"> <li>Subcontractor Supervisor</li> <li>Package Manager / Planner</li> </ul>                       | <ul style="list-style-type: none"> <li>Project Team</li> </ul>   | <ul style="list-style-type: none"> <li>Project Team</li> </ul>  |
| What  | <ul style="list-style-type: none"> <li>Daily output compared with planned output</li> <li>Assessment of discussed delays</li> </ul> | <ul style="list-style-type: none"> <li>Online Form</li> </ul>  | <ul style="list-style-type: none"> <li>Continue gathering data and monitor against planned output</li> </ul>          |
| How   | <ul style="list-style-type: none"> <li>Scorecard graph</li> <li>Whiteboard</li> <li>Project Meetings</li> </ul>                     | <ul style="list-style-type: none"> <li>IDE Code</li> </ul>   | <ul style="list-style-type: none"> <li>Track data weekly</li> <li>Review regularly</li> </ul>                         |
| Where | <ul style="list-style-type: none"> <li>Project Team Meetings</li> <li>Daily Whiteboard Meetings</li> </ul>                          | <ul style="list-style-type: none"> <li>Site Warehouse</li> </ul>   | <ul style="list-style-type: none"> <li>Continue to post data in Control Room</li> <li>Email</li> </ul>                |
| When  | <ul style="list-style-type: none"> <li>Weekly basis</li> </ul>  | <ul style="list-style-type: none"> <li>Daily</li> </ul>  | <ul style="list-style-type: none"> <li>Weekly</li> </ul>  |
| Why   | <ul style="list-style-type: none"> <li>Gain learn the results of the improvement</li> </ul>   | <ul style="list-style-type: none"> <li>Old form to be discontinued completely so they don't affect the change</li> </ul> | <ul style="list-style-type: none"> <li>Ensure form is operating as efficiently and effectively as possible</li> </ul> |

Figure 5. Control Plan

## Lean Initiative Improvements & Impact

This process-improvement initiative is still in its early stages, so the full list of benefits has not yet been realised. One of the key advantages of the Lean roll-out on the project is that the wider team now has a better understanding of waste, value-adding activities, and non-value adding activities.

Other anticipated benefits include:

- **Improved Data Collection:** It is expected that the collected data will see increased accuracy due to it being captured at the end of each day before it is forgotten. It will also be collected by the individual responsible for that area of work. The obligatory fields will prevent items being skipped, resulting in a higher quality of data being captured. This data will be better placed to paint a more accurate picture of the installation period and can be used by the pre-construction team when tendering for similar jobs. This data can also be shared with the subcontractor.
- **Increased Visibility Boosts Collaboration:** The data collected in the online form will automatically generate graphs to depict any delays encountered. It can be used to provide discussion points when collaborating at the weekly Pull Plan. If actual

output varies from the planned output, the established daily output required can then be altered to achieve the target date.

- **Reduced Abortive Work:** Given that the data must now be recorded by one individual on one form, the time lost recording the same information in different trackers is reduced. The online form takes less than 1 minute on average to populate.
- **Documentation of any Deviation in Planned Works:** The planned works for the following day are documented in the form and can be used to compare against actual output. This will be helpful when tracking productivity levels and monitoring any deviations.
- **Readily Available Data:** Now, data is immediately available for multiple parties once the form is submitted. This data can be accessed by package managers, engineers, planners, quantity surveyors, and so on. This has been most beneficial for those working from home throughout the pandemic.
- **Lean Thinking:** The concept of seeing pain points as opportunities has been established. Applying Lean thinking to problems has demonstrated the benefits of this approach and encourages us to seek further opportunities on our projects.

