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Management Consultants to the Precast Industry

RESULTS IMPROVEMENT BULLETIN

PRECAST BUSINESS RESULTS IMPROVEMENT BULLETIN

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LEAN FOR ENGINEERING AND DRAFTING

Lean management is a method to drive speed, quality and cost improvements. A growing number of precasters are using this approach to improve production operations. Lean management principles also work well to streamline key processes in engineering and drafting. It's well known that improvements to these early stage activities create significant leverage in plant and field productivity gains.

(For definitions of lean terminology used in this Bulletin, please refer to prior Results Improvement Bulletins that provide descriptions of the basics of lean management and explanations of common lean management terms. These are available at www.mjsmanagement.ca/results.htm.)

Lean's emphasis on customer focus will drive improvements

A value stream analysis of engineering and drafting process will uncover a variety of sources of waste. The power of lean thinking is that waste is defined from the customer's perspective. From this perspective work steps are examined in a new light – and habits and activities are challenged and improved. Three examples:

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1. Standardization

Most engineering teams struggle to create and implement standards. In fact, some precasters have invested considerable time and resources to create standards only to find that over time use of the standards deteriorates – due to people changes, project time pressures, lack of training, lack of agreement on standards, not invented here resistance or a variety of other reasons.

The transformation to understanding value from the customer’s perspective will influence acceptance of standards. Consider if the engineer or drafter had the opportunity to ask the customer this question “is your preference a standard element that I can pull from a library at nominal cost or a custom element that will be more expensive to design, draw and fabricate?” While this question can’t be asked in every instance, the transition to lean thinking creates deeper focus on the customer and their true needs. Often this supports the conclusion that a standard, even with associated trade-offs, is the best overall solution.

2. Attitude improvement

Many engineering and drafting teams set goals for “attitude improvement” within their teams – meaning more accountability and ownership for quality, work ethic and deadlines, skill development, responsiveness and relationships with internal customers in production, field and sales.

Lean management strongly reinforces this culture change and provides a good set of tools to make progress on these difficult to achieve softer objectives.

3. Adopting pull and flow concepts in drafting (planning and optimizing work flow) improves throughput and productivity

Lean principles place a focus on total systems flow with the end customer pulling activity rather than the producer (in this case, engineering or drafting) pushing outputs.

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In situations where outputs from engineering, drafting, production and field are not fully coordinated or planned significant waste will be created - drafting waits on design information, production and field wait for shop drawings, drawings are issued in a sequence that reduces plant and field productivity.

Additionally, poor flow creates queues that dramatically reduce throughput. For example, a drawing waits for a number of days before checking or review. With improved use of pull and flow concepts, the waiting or queue time will be reduced or eliminated.

Other common sources of waste in engineering and drafting

Lean management practices will identify many other opportunities to improve productivity, quality and throughput in engineering and drafting processes. Some examples are:

- Work practices not fully standardized – individual style preferences result in one person performing a task differently from others. This introduces variability that creates waste for others and impedes continuous improvement.
- Best practices not identified and adopted.
- Re-drawing – incorrect assumptions or assumption that are not verified with the customer lead to re-drawing (other instances where customer provides incorrect or limited information are more challenging to improve).
- Project kick-off process weaknesses (missing, dated or incorrect information) slow the engineering and drafting teams.
- Document control time waste – drafters spending time to ensure they have the most current versions of drawings, awkward processes for managing the distribution of drawings.
- Error proofing – adopt lean error-proofing concepts to improve design, shop drawing and material list quality; also streamline checking and reduce scrub activity. Often, quality problems are passed up the line – drafter to checker to engineering to production – rather than dealt with at the source.

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- Design for manufacturing and field – reduce instances where designs create wasted labor or materials in the plant and field functions.
- Improved accountability for materials selection and material costs.
- Managing subcontractors – often inadequate processes are in place to proactively manage subcontractors resulting in schedule and quality problems.
- Duplication between engineering, drafting and project management during the RFI and other processes.
- Management process and cells (work teams) – often (although in many cases unfairly) design and drafting teams are viewed to lack the sense of urgency contained in production teams. For a production team, the piece must be poured or shipped today so crews and supervisors don't leave until the job is done. Lean's customer focus and cell concepts can create a tighter linkage between engineering, drafting and production – leading to better service, higher levels of ownership for the total project and more cooperation.

Conclusions

Applying lean management principles to engineering and drafting functions will lead to a variety of service, throughput, quality, productivity and attitude improvements. Non-value added activity in the range of 30% or greater will commonly be identified.

For additional information on using lean management to gain speed, quality and cost improvement in your engineering and drafting functions please contact us at 206-388-5209 or info@mjsmanagement.net.