

conference preview

QUALITY PROCEDURES IN DETAILING OFFICES

BY DAVID MERRIFIELD

Maintaining and improving quality is not just a matter of having a quality process in place, but also regularly examining it, updating it as necessary and making sure it's being followed.

"WHEN PEOPLE AND ORGANIZATIONS focus primarily on costs, costs tend to rise and quality declines over time."

These are the words of famed engineer and statistician W. Edwards Deming. And he was right.

Quality in steel construction today reflects changes in attitudes and management styles developed over the last three decades. Working in the 70s and 80s as a detailing manager for a bridge fabricator, I was charged with the annual review of our quality control (QC) manual and overall compliance with our shop and erection drawing quality standards. Later, as a plant manager and business owner, I developed an informal goal of "no errors," which became the workplace norm with everyone taking ownership and pride in the success of the company. "Writing it down"—a concept stemming from two of Deming's statements—was instrumental to the success of our company. Those two statements are:

1. "If you can't describe what you are doing as a process, you don't know what you're doing."
2. "It is not enough to do your best; you must know what to do, and then do your best."

Deming's Contribution

World War II completely destroyed industry and business in Japan, and General MacArthur consulted Deming to see what could be done. During the next 30 years, Deming contributed to the economic reformation of Japanese manufacturing, now known for its high-quality products and advanced innovation. His belief was that if you improve quality, you reduce expenses and increase productivity. In his 1982 book *Out of Crisis*, he posed 14 points for building a successful and high-quality orga-

nization. In the mid-80s, the U.S. Navy adopted a total quality management (TQM) program based on Deming's work, and in the 90s that knowledge evolved into programs such as the AISC Quality Management Systems Certification program, ISO, Lean Manufacturing and Lean Construction. All of these programs have their roots in Deming's work.

With his 14 points and later in his "Seven Deadly Diseases of management," Deming proposes a concept of achieving quality by engaging the total organization. It's not enough to engage only management groups or quality departments; you need to build a quality system the same way you manage safety. Safety engages everyone from the CEO to the support staff, all participating in a safe work environment. This safe workplace culture is achieved by having a plan, providing continuing education and engaging the workforce to actively identify unsafe situations.

Can you imagine a safety program goal of "one workplace injury every 1,000 man hours?" Goal setting of this type only provides an excuse for not being engaged. Why then should we have a quality program that sets goals such as "one error every 100 pieces?" One error can be the difference between profitability and massive additional expenses. A proud and involved workforce pays attention to the details. From the first concepts of design to the final turnover, providing a quality product and service should be the target of the whole team. The only goal should be "I know what I'm doing, and I am achieving my best."

In today's world of "time is of the essence" contracts, speed is stressed as goal number one. I often refer to the story of Henry David Thoreau's desire to create a perfect walking stick. After thinking about the process, he decided not to pursue the endeavor because it would be an achievement that would consume his life. The three elements of production (time, price and quality) restrain us all. It's often said you can only choose two and must sacrifice one. To correct this concept, everyone in the supply chain of design through construction needs to be engaged in doing their best. For example, a concerted safety effort across the entire manufacturing industry has boosted profitability by lowering cost, elevating morale and increasing productivity through team effort. A safe company is a profitable company. The same is true of a quality management program. You achieve profitability and success by instituting a system with quality as its



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core. Starting a quality management system should not be a radical adjustment but rather should come in the form of small achievable programs that grow and expand.

A New Approach

So how does quality apply in the world of steel detailing? NISD's (National Institute of Steel Detailing) Quality Procedure Program (QPP) has been in place for some time. It was developed to mirror, to some degree, the old AISC checklist certification program. There were two elements to the QPP: a checklist of required points and an on-site audit by an engineer local to the detailing office. The program worked well during the early years, primarily due to the number of engineers who were trained in the steel industry. But the retirement of many that understood the fabrication/detailing process strained the audit program. The rapid growth of offshore detailing also posed logistical problems. It was clear that a review of the program was necessary. Both the checklist and the audit program required new thinking.

Engineering firms interviewed by the QPP committee were reluctant to review quality procedures, as they were unfamiliar with the detailing and fabrication processes and viewed the audit as a liability issue. The primary question in the initial review was "Is there a need for detailing companies to have their own quality procedures?" As the final responsibility for the fabricated product is ultimately part of the contract, many fabricators believe their quality manual is all that's required. However, detailing firms require an internal set of guidelines when dealing with different fabricators to ensure a consistent quality presentation.

Detailing service has fundamentally changed from providing a picture to transmitting data. Information now contained in the model is imported directly into shop processes. While this is a more efficient fabrication workflow, there are fewer eyes reviewing the work. In addition, detailing offices now have fewer workers per project. In today's environment, model checking is more the norm rather than a complete check of individual drawings. In the short interval between creation, approval changes and comments, the review of all information can be daunting.

Chapter N of the AISC *Specification*, "Quality Control and Quality Assurance," sets the requirements of quality in steel construction. The user note on drawings states that QC inspection

is based on shop and erection drawings alone. The 3D modeling process produces fewer shop and field errors, but the inclusion of quality instructions such as welding and other non-model attributes is a common issue between detailer and fabricator.

Consistency and Repeatability

The aim of a quality management system is to provide a consistent, repeatable process. Developing written procedures and maintaining communication standards provides continuity within a changing workflow. Factors such as rotating personnel, new software, employee training and communication affect customer satisfaction.

But by using the current NISD format (adopted in 2015) and following the checklist, a company can develop a quality management manual to be certified. Here's how it works: QPP certification is now based on a quality procedure manual that uses the NISD-developed checklist as its guide. The committee audits the submitted manual, uses the checklist to evaluate each item and makes acceptance recommendations to the president of NISD. Note that the QPP committee makeup has been altered to include members from outside the detailing community; only two of the five members are from detailing companies. The other three represent the fabrication, erection and software development communities. The concept of quality assurance was removed, as this is provided by customer review and satisfaction. This program is under constant review to stay current with new trends and procedures, such as building information modeling (BIM) documents and initiatives. The application packet includes a copy of the checklist and a sample manual.

But keep in mind that this manual is not a blueprint for your company's management system. Deming's work was criticized for not providing a sample plan, and his response was, "You're the manager, you figure it out." Every company has a different approach to management, and thus every plan should reflect unique elements. NISD's mission is to provide guidance and to encourage adherence to your company's specific plan. ■

This article is a preview of Session D2 "Quality Procedures in Detailing Offices" at NASCC: The Steel Conference, taking place March 22-24 in San Antonio. Learn more about the conference at www.aisc.org/nascc.

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