

## **Ideas Behind the Implementation of Total Quality Management in INDOT's Division of Design**

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### **BACKGROUND**

The implementation of Total Quality Management in INDOT's Division of Design began as an effort to probe the reasons for numerous complaints by staff engineers and District Construction personnel that the quality of our construction plans has deteriorated. With increased production due to higher construction funding levels, pressure in recent years has been on production, sometimes at the expense of quality. Finding a solution to this problem was the impetus for the creation of the position of Quality Management Engineer last August. The broad assignment was "to finding out what's wrong" and to propose solutions to the problems discovered.

Thus began an effort that we feel will have positive effects on the Division of Design as well as Indiana's transportation design and construction community through the end of this decade and into the next century.

### **BASIC PRINCIPLES**

The Division of Design's implementation of TQM is based on six basic principles of quality.

1. Every job activity is a process that has inputs and outputs. These processes are the tasks we do every day in order to produce our product: construction plans and specifications. The processes are characterized by the fact that they involve change. They are repeti-

tive so that an improvement to the process casts a shadow that has an effect over generations of repetitions of the task.

2. Quality is compliance with the customers' requirements. The requirements are error free work. One of the perceived problems with the quality of construction plans and specifications is that we do not have a solid definition of the requirements for the production of those plans and specifications. Part of the TQM effort will be to define the requirements for our plans and specifications. This will be done through the design manual and through changing our process to allow more information flow to all parties involved.

3. The method for achieving error free work is prevention. We believe that quality cannot be inspected into work. By the time an inspector finds a problem in a set of plans, the mistakes are already drawn on the mylar, probably in ink. The TQM effort shifts the focus from inspection to prevention of errors. It says, lets do it right the first time - lets prevent the mistakes from getting onto that mylar in the first place.

4. The cost of quality is measurable. Changes to the processes in design will be implemented based upon proposed savings or proposed improvements in customer service. Training has already taken place to give the TQM facilitators the tools they need to

help staff calculate savings from quality improvement ideas.

5. Quality and productivity are inseparable. A basic tenet of TQM is that as quality goes up, productivity goes up. This is because TQM focuses on the processes, not on the product. Improving the processes improves the product as a side effect. Samples are taken, not to judge the product, but to measure the effectiveness of the process.

6. The keys to Quality are Commitment and Teamwork. We in Division of Design are fortunate to have management support of the TQM effort. Management has committed to maintaining a high level of effort and visibility for the program. In studying our plan production processes, we found that, while some projects floundered, others flourished. The common thread among the projects that "went right" were that those projects were well managed. This pointed to the need for people who are designated as project managers, and providing training to our staff to get them to project manager status will be a key aspect to our TQM effort.

### **Implementation Notes**

A powerful vehicle for enabling our staff to thin in terms of quality and process is the empowerment of action groups to deal with any problem that prevents anyone from performing their work efficiently. Some of the action groups in existence now are:

1. Quality Management Group. This group acts as Design's TQM "board of directors." Its mission is to oversee and guide the TQM effort for the Division, and make recommendations to management for changes to processes and procedures.

2. Plan process action group. This group has the task of studying and documenting the processes by which contract plans and specifications are produced.

3. Design/Construction action groups. These groups are coalitions of designers from INDOT and the private sector, contractors, and district construction representatives. These groups meet regularly to discuss mutual concerns and to communicate ideas

each group has that might affect the other groups involved.

4. Piling action group. This group was called together to solve the recurring problem on bridge plans of underestimating of piling quantities.

5. Training action group. This group meets to propose training to the Quality Management Group and to management. Many design problems can be traced back to lack of training. This group has the task of identifying those problems and recommending training to address them.

6. Quality Control action group. This group was formed to look at the consultant evaluation system and suggest improvements to it.

Some action groups are permanent, others come into existence only to solve a specific problem and are dissolved when the solution is found. The key to the action group system is that it has management support and the members are empowered to solve their problems. Instead of employees saying to management, "Here is my problem; what are you going to do about it?," they can say "Here is my problem, lets get together and solve it."

Another vehicle for empowering all staff members to improve their jobs is the creation of a suggestion system for employees. These suggestions are "Opportunities For Improvement." This concept says that there are no problems, there are only opportunities. The focus is shifted from blame to solution. All D)'s will contain cost saving calculations, and all suggestions will be considered and answered.

### **Conclusion**

The ideas at the core of the Division of Design's TQM implementation are not new. A common remark heard during the initial TQM training was that TQM is just common sense. Many of our staff members intuitively practice the principles of TQM every day.

Our implementation of TQM merely formalizes the application of this "common sense." It gives our common sense a vehicle for entering into every aspect of our jobs.