



By George Berg and Richard Dutmer

PRODUCTIVITY, QUALITY AND SAFETY

A Relationship for Success

Construction productivity can be improved and projects made more profitable if the installation quality is increased and jobsites are safer. At first glance, the relationship between productivity, quality and safety may seem incidental and remote, but they are more interrelated than one might think.

PRODUCTIVITY

Construction labor in the field is a large part of the profitability equation and a major resource to many construction companies. Direct field labor is one of the largest components of the cost of

construction. However, the managers of that resource, field supervisors, are often undertrained. Key areas for improvement of field supervisors include crew motivation—daily planning, training of subordinates, managing contract changes and communication with owners, designers and other trade contractors.

In addition, the studies performed by the Construction Industry Institute and FMI indicate that roughly one third (30 percent to 35 percent) of all field labor falls into the category of recoverable lost time—time that could have been productive if there had been

better training, task instruction, understanding of the quality standards and some system to observe and measure if the desired results are being achieved. Simply put, better management is needed.

Again, training (how) and task instruction (what) given in a clear unambiguous manner are essential. Procedures for putting the work in place must be discussed and detailed in daily planning sessions. Then observation must be made to ensure the task is being carried out correctly. Measurement and reinforcement of the appropriate behaviors must also occur. Task instruc-

tion, developing task procedures and making observations to reinforce work being accomplished according to plan is essential to productivity.

QUALITY

The quality of the initial installation of construction materials can be a key factor in the profitability of many projects. Making crafts people aware that they should accomplish their tasks according to a standard (e.g., the contract specifications) is an important aspect of getting the job done right. Pre-task planning, coordination of the materials, tools and equipment, proper instructions and trade or technical skills are critical to proper installation and, ultimately, the project's success.

Measurement to determine that these critical activities are occurring is vital, but there must also be reinforcement for doing the work correctly according to agreed upon standards. Deficiencies in quality manifest in a variety of ways, chief among them is rework. The cost of rework is tremendous.

Research performed by the Business Roundtables Construction Industry Cost Effectiveness Project concluded that losses in production primarily resulted from absenteeism and turnover. The root cause of this is workers having to perform their jobs in unsafe working conditions and having to perform excessive rework. Installing work usually includes selecting the material, purchasing the material, transportation to the workplace, unloading and staging. The labor to install the material has a similar sequence of events. When work is not done according to standard, the originally installed work has to be removed

and then all of the installation steps repeated. Originally, there was one set of steps—when rework occurs the work is multiplied by three!

The cost of rework can very easily be three times the original budget. For example, a \$20 million a year contractor who spends \$5 million on direct labor and has a 2.5 percent incidence

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of rework would be losing approximately \$375,000 annually (\$125,000 x .05 percent x 3 times) in labor alone. If the opportunity cost of having workers ignore the work they should be working on while they were removing work and then reinstalling it, the cost could be five times the original amount.

Rework can also cause collateral delays and disruption to surrounding work. Although the amount of rework is not the only measure of quality, it is a key indicator of how much attention is being paid to the concept of quality.

SAFETY

The Occupational Safety and Health

Administration indicates that the construction industry continues to have the highest work place injury rate of any major sector. In 1987, the Bureau of Labor statistics reported that the construction industry ranked first in both fatality and injury rates, a number that has not changed in 1997. The National Safety Council reports that construction accidents claim six lives and are responsible for nearly 520 disabling injuries every workday.

In an **ENR** article titled, "Unions Building a Health Machine," it was reported that approximately 2,100 construction workers die in the United States each year. Besides being a tragedy for the individuals and the families involved, the construction industry's record of safety increases the cost of doing business. The construction industry's track record on safety is poor, very costly and in need of improvement.

Construction accounts for only 5 percent of the gross national product, but 20 percent of the workplace accidents. As a direct result of the losses, insurance companies and bonding agencies have increased workers' compensation rates dramatically. As far back as 1989, injury losses approached \$112 billion in direct cost and another \$20 billion to \$30 billion of lost productivity due to injuries, fatalities and lost-time accidents. The problem has become so serious that some construction companies, in an effort to reduce their workers' compensation rates, are "prescreening" the medical records of new applicants for their workers' compensation history.

The relationship between safety and productivity is clear. More attention to

safety increases productivity on construction jobsites, reduces the direct and indirect costs of construction accidents and, therefore, improves profits. But how can this be true when these activities seem so different? One answer could be that doing the job according to a defined set of standards integrates quality and safety, and the net result is increased productivity. You could bet that “doing the job right” with high quality and productivity would provide a safer work environment because safer behaviors are being exhibited.

Effective planning, training communication and motivation are the tools for encouraging people to do their work correctly. The table on page 104 com-

pares the traditional and a more contemporary view of productivity, safety and quality

Where there is a history of, or potential for, major productivity, quality or safety problems combined, the job/task training will decrease substandard performance. Accidents and losses will be reduced and productivity increased. Losses have their origin in the same set of circumstances.

- The basic causes of low productivity, subquality and accidents are the same.
- Chance determines whether these common causes result in loss to people, property or productivity.

- The vast majority of lost productivity, subquality and accidents results from inadequacies in the management system.
- Losses to people, property and production don't just happen, they are caused.
- Adequate programs, task planning and compliance with these standards can effectively control the basic causes of loss.

When field forces are put into situations where productivity, quality and safety standards are compromised, the cost of the project can escalate dramatically. Doing things in the field correctly can go a long way toward increasing productivity, quality and

CONTEMPORARY	TRADITIONAL
Proper job/task instruction	Productivity instruction Quality instruction Safety instruction
Standard job/task procedures	Productivity procedures Quality procedures Safety procedures
Planned job/task observations	Productivity observations Quality observations Safety observations
Positive reinforcement for doing the job the right way	Productivity reinforcement Quality reinforcement Safety reinforcement


improving safety. When there is a conscientious process improvement effort in one area, the other areas benefit as well. Field productivity improvement programs, safety training and programs like Total Quality Management will pay for themselves through increased productivity, lower employee turnover, lower insurance rates, less rework, lower labor cost and reduced downtime.

These separate efforts can be combined into a company philosophy of continuous improvement that addresses productivity, quality and safety. The general steps for a program that includes all three is listed below:

- Baseline current management, practices, behaviors and performance.
- Inventory and define acceptable behaviors, commit resources, establish tracking and measurement systems.
- Implement best practices in the field, measure conformance.
- Provide training, build commitment and reinforce implementation of best practices.

To stay current in the highly competitive construction environment may demand re-engineering of the methods and manner in which construction corporations operate and view their investment in productivity, quality and safety. The concept that productivity,

quality and safety are all closely related is not difficult to grasp. It starts with doing things according to pre-established standards.

Those construction firms that recognize the relationship between productivity, quality and safety and take action will save lives, increase profits and have a whole lot more fun. 

About the Authors

George Berg and Rick Dutmer are part of FMI's Quality Productivity Improvement Group. FMI, the nation's largest management consulting firm specializing in the construction industry, has offices located in Raleigh, N.C.; Tampa, Fla.; and Denver.