LEADERSHIP AND QUALITY CONSTRUCTION

By Major Edward Hayes and First Lieutenant Terry Wendt

Everyone likes quality. From the clothes we wear, to the cars we drive, to the food we eat. If that's so, then why is quality such an elusive thing? How many times have you heard your friends, neighbors, or family complain about the shoddy materials or workmanship that they've had to endure at one time or another?

The same idea applies to troop construction projects. Everyone involved wants a quality product—but it doesn't always happen. Quality does not magically appear in anything, much less in an engineering project. What must leaders do to ensure that quality is an integral part of their construction product—and not just an exercise in lip service?

Quality is a leadership challenge that can be met using a three-step approach:

- ▶ Identify the standards
- ▶ Evaluate and conduct necessary training
- ▶ Establish and enforce quality control

All three steps share a common denominator of leadership. Making quality happen is up to the chain of command. A close look at each step, and how they fit together, will show how the diligent pursuit of quality can pay big dividends for both the project and the soldiers who work on it.

Standards

What standards do you use to measure the quality of your construction? How can your soldiers tell if their work is satisfactory?

In the theater of operations (T/O), Army construction standards are detailed in the Army Facilities Components System (AFCS), TM 5-300-series manuals. The AFCS identifies two T/O standards—initial and temporary. Initial construction is intended to have a useful life of six months or less. Temporary construction uses more durable materials and has a theater life of up to 24 months.

The AFCS also uses the four climatic zones of temperate, frigid, tropical, and desert to determine the construction standards. Simplicity, ease of construction, and function take precedence over aesthetics in T/O construction.

On the other hand, structures built to last beyond 24 months are called troop construction projects. There is no consolidated reference manual detailing troop construction standards. Workmanship requirements vary regionally, especially overseas where host nation safety standards, construction methods, and materials may be totally different. Normally, these projects support the installation's Directorate of Engineering and Housing (DEH), which establishes the general construction quality expectations. Troop construction, therefore, requires a balance between function and appearance.

Leaders must set the standard for workmanship by first analyzing the purpose of the project. Permanent or highly visible structures require a higher level of craftsmanship than temporary or utilitarian ones. For example, if you're renovating a child care facility, even the smallest imperfection may detract from the project's appearance and safety. Conversely, if you're constructing gravel storage bins, there's little need to sand the lumber or to patch stray nail holes. The level of craftsmanship, therefore, must be in tune with the intended character of the finished product.

Workmanship standards are found in local, state and national building codes. Their purpose is to ensure the public safety by describing, often in minute detail, the minimum acceptable performance criteria of the finished product. Codes are legally binding, and they are written in precise language in order to define exactly what constitutes compliance and what does not. Simply put, codes establish tests which the project must pass.

Building code compliance is normally addressed during the design phase. Designs are carefully reviewed prior to their approval to make sure they comply with applicable codes. A basic knowledge of code requirements enables leaders on the jobsite to identify code violations before they become difficult to correct. A current and easily accessible library of building codes is an absolute necessity in your unit. If you do not have them on hand, your DEH can provide the appropriate code requirements.

Specifications complete the definition of acceptable workmanship by conveying the intentions of the client. For example, a specific set of plans may call for a door in a certain location. Codes only specify the safety aspects the door must have in certain situations. They don't indicate what kind of door, the type of finish that should be applied, or what grade of hardware to use.

Specifications, which accompany the drawings, answer these questions. They range from simple notes appearing directly on the drawings to separate volumes hundreds of pages long. Specifications most often describe the grade or quality of materials to be used in a project. They can also describe construction techniques, define the acceptable margin of error, and set the performance standards for the project.

Specifications may change during the course of a project due to material availability or budget constraints. Before construction begins, leaders must ensure that they are provided with adequate specifications. However, they also owe it to the client to recommend changes that will improve the function, safety, or appearance of the finished product. Once specifications are clarified, adherance to them will go a long way toward achieving quality construction.

Training

Because of normal personnel turnover and project complexity, (i.e., T/O construction versus troop construction), leaders must continually evaluate the individual and collective levels of craftsmanship in their units. Several methods exist to help leaders evaluate soldier expertise levels and training requirements. The most common are individual counseling, supervisor recommendations, review of workmanship on prior projects, and performance testing. This information should be analyzed to determine why the unit has these strengths and weaknesses and what steps can be taken to improve the weaker skills.

Young soldiers new to your unit have an "experience gap"—the difference between the skill level achieved through formal instruction and the skill level achieved through hands-on construction project experience. Upon graduation from Advanced Individual Training (AIT), soldiers in Career Management Field (CMF) 51 (Figure 1) have received introductory training in many areas.

The NCO Education System (NCOES) provides formal instruction for NCOs as they advance in rank and responsibility. In the Basic NCO Course (BNCOC), sergeants

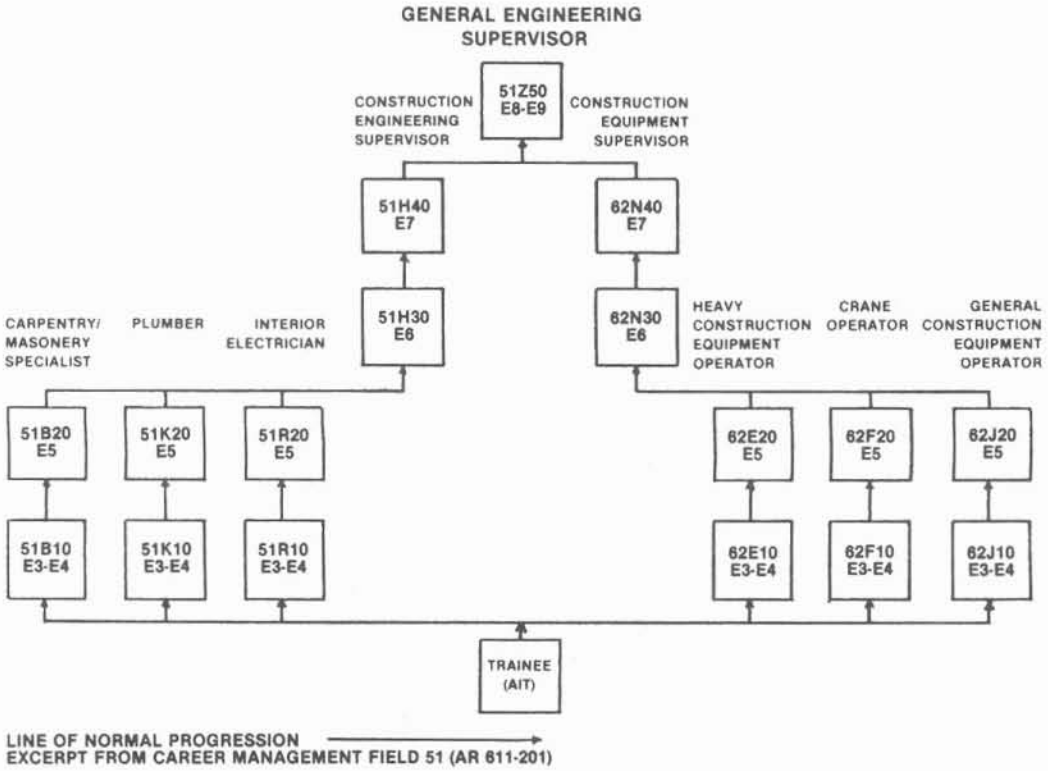


Figure 1



Photo by SSG David H. Funk

As part of a troop construction project, soldiers from the 1249th Engineer Battalion work on a rest facility at Paulina Peak in the Deschutes National Forest in Oregon.

learn the supervisory skills and complex construction techniques needed for their new MOSs. In the Advanced NCO Course (ANCOC), staff sergeants are taught advanced construction management techniques that they will use as platoon sergeants and project NCOICs.

Lieutenants in the Engineer Officer Basic Course (EOBC) are taught Army construction techniques and construction management. This gives them a basic knowledge of troop construction, which they will use later as project OICs.

The intent of formal instruction is to teach soldiers the basic concepts behind each task. There is not sufficient "hands-on" training included to make them skilled construction troops or supervisors. Soldiers must practice their newly acquired skills to make them proficient enough to produce quality results.

To support the hands-on training, your battalion S-4 should stockpile appropriate materials for carpentry, masonry, electrical, and plumbing MOSs. Horizontal construction skills can be enhanced through range and road maintenance projects that are not time-sensitive.

Similarly, union tradesmen such as carpenters, masons, and plumbers, receive hundreds of hours of formal instruction and are apprenticed in their respective fields for several years before they are certified. During this apprenticeship they practice what they learned in the classroom. Formal and informal instruction, supplemented with practical experience and supervised by personnel proficient in the trade, closes the experience gap and enables troops to construct any project with superior results.

Once the standards are identified by codes, specifications, and knowledge of construction practices, leaders must communicate them to their soldiers. Depending on the unit's experience, this sharing of ideas can range from simple to complicated.

If the unit has performed similar work before, an effective approach is to compare past results with those expected from the project at hand. This allows troops to recall mental images of past work, which they can then use to judge their current workmanship.

Inexperienced troops facing new construction techniques lack the data base from which to draw images. They require a detailed description of what is expected of them. In this case, a picture is worth a thousand words. Drawing a sketch of what the leader defines as "good construction" helps transfer the idea from one person to another. It also serves as a means to determine whether the standards were met.

Another effective way of training to standards is to have the troops build a small portion of each project phase for use both as a model and the craftsmanship standard. For example, prior to beginning the electrical rough-in phase, troops assemble a sample of each type of connection and wiring sequence used in the project.

This approach has two benefits. First, it results in a three-dimensional portrayal of acceptable workmanship that soldiers can use as a reference. Second, it serves as a vehicle for hands-on training. Experienced soldiers can train inexperienced soldiers on the construction quality standards, code requirements, safety, and craftsmanship required for each task.

The time, effort, and materials spent on test sections and models are well worth it, and inevitably result in improved productivity and product quality.

Quality Control

Once the standards are identified and soldiers are trained and certified, leaders must ensure their troops apply the training to produce quality results. This is best done by formulating and implementing an effective quality control (QC) and quality assurance (QA) plan.

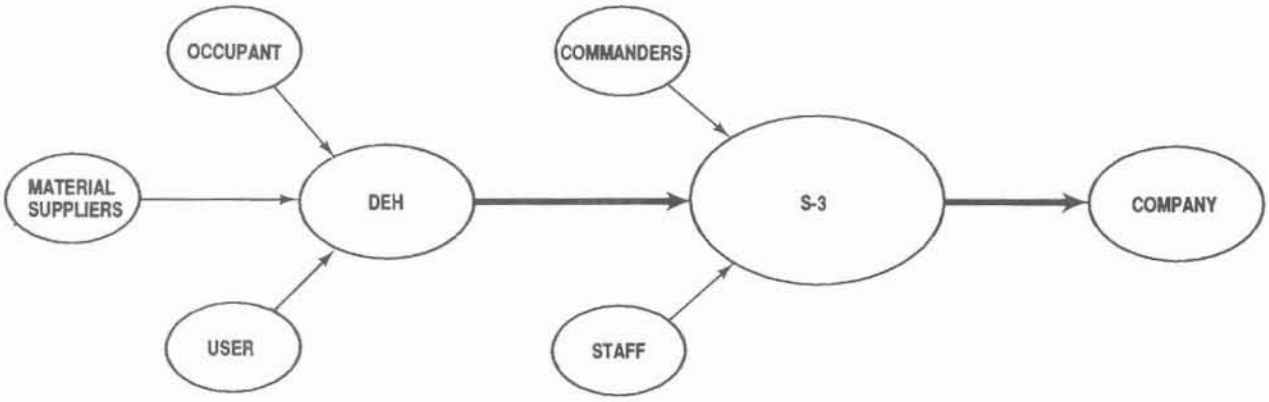


Figure 2

The QC/QA plan outlines a systematic quality enforcement program, just as a training schedule outlines a systematic training program. And it should be adhered to just as religiously. Initiating and enforcing the QC/QA plan is the key to quality troop construction because it identifies the accountable and responsible chain of command.

Quality control is the constructing unit's responsibility. The project OIC and NCOIC plan how to monitor the level of craftsmanship on the jobsite. The QC plan should identify the tasks to be checked, who checks them, how often they are checked, and briefly describe how each task is inspected.

For example, the QC plan calls for the NCOIC to check the formwork prior to concrete placement to ensure the forms are the correct size, are properly braced, and are level and plumb. This is accomplished by consulting the plans to verify that form components are in their proper place, checking dimensions with a tape measure, and using a level to check for horizontal and vertical alignment. Thus, the QC plan needn't be complicated or technically overwhelming. Common sense will usually give you the most mileage when it comes to troop construction.

The soldier doing the work must be the first level of inspection of any QC plan. Mistakes are quickly discovered and best corrected when soldiers inspect their own work. Soldiers should expect consequences for second-rate workmanship. "Do it right or do it over" makes quality workmanship a habit.

The second level of QC responsibility is the soldier's immediate supervisor. He must continually inspect the project to convince soldiers their work will be inspected and construction standards will be enforced.

Quality assurance is the responsibility of the battalion S-3, who focuses on QA to ensure compliance with plans and specifications. The S-3 must be the focal point of the project, coordinating the actions of everyone involved (Figure 2).

From this central position, the S-3 and his section can control everything that may influence the project, including design changes, material shortages, and construction errors. He can then quickly resolve any difficulties that may arise. QA inspectors must be readily available and accessible for the QC/QA plan to work. If they are not, the S-3 becomes a bottleneck, rather than a focal point.

The feedback provided to the constructing unit tells them if they are on target, and what they must do if they are not. In essence, the S-3's QA program ensures the quality of the constructing unit's QC.

Since most projects are troop construction, leaders must continually conduct hands-on training to raise their soldiers' level of construction expertise beyond theater of operations standards. Leadership must also clearly define the standards of quality and hold the project chain of command accountable.

As the habit of craftsmanship grows stronger, troops spend less time correcting mistakes and more time producing results. Enthusiastic, confident, and self-motivated soldiers require less supervision and few reminders that quality counts. Good workmanship becomes a personal goal. It becomes something they expect and demand of themselves because they enjoy the pride and sense of accomplishment that goes with a job well done.

And when that happens, that elusive thing called quality becomes a natural part of troop construction.

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