

APPA Effective and Innovative Practice Award Submission January 2008

University of Missouri-Columbia, Campus Facilities Planning, Design & Construction's "Inspection by Trades Program"

Statement of Program

At the University of Missouri, Campus Facilities-Planning, Design and Construction employs a variety of strategies to help ensure that construction put in place by private contractors is satisfactory. One such strategy, The Inspection by Trades Program, is designed to utilize skilled trades personnel from various Campus Facilities departments to review, or inspect, the work of contractors. The program utilizes expertise already on staff to inspect work *during construction*. MU employees with various skill sets work with our construction project managers onsite checking for workmanship issues, application of materials, equipment access, maintainability and overall work quality.

The Inspection by Trades Program is completely voluntary and is succeeding well beyond our expectations. Trades personnel are enthusiastic about the opportunity to be involved, construction project managers welcome the help and contractors like the fact that it helps them avoid costly rework.

Not only have we seen improvements in the level of craftsmanship and work quality, but we're also gaining very meaningful improvements in teamwork and collaboration. Trades personnel who may have previously felt "stuck" with the finished product are now engaged and providing excellent feedback. As a result we're a much stronger team delivering better projects.

Institutional Benefits

Are comments about poor work by contractors common within your facilities organization? Do the people who operate and maintain your facilities feel that everything they “fix” is something the contractor did wrong? Deficient work by contractors can be a significant problem. Despite the best design and materials, the best contractor and the best of intentions, all can be for naught if installed work is below par. As with many issues in higher education these days facing facilities managers, the question of deficient work by contractors becomes “What can I do with the resources I have”?

This question was at least partially answered last year as a result of a routine shop meeting in which insulators in Campus Facilities Energy Management department voiced concerns to their supervisor about contractor workmanship. They were seeing things on completed projects they felt should have been pointed out and corrected prior to acceptance of the project. The session led to a meeting with the associate director of construction management, and the Inspection by Trades Program was begun.

Benefits of the Inspection by Trades Program are many, but first and foremost is quality work being completed in a craftsman-like manner. Nothing can spoil a good design quicker than poor workmanship. The problem is that poor workmanship often goes unnoticed, especially to the untrained eye. In construction work, we learn very quickly that things are not always as they appear; that it takes experience to “learn the tricks.”

The best way to highlight the primary benefit of this program is to cite a real example. Following initiation of the Inspection by Trades Program, an insulator during a routine inspection discovered that ductwork had been incorrectly installed in a laboratory project. From the floor the job looked good but, in many locations, the top of the duct was left partially exposed, a condition that could later have led to severe problems. The inspection, however, occurred early in the construction phase and the deficiency was caught while it could be corrected with

relative ease. Had the defective ductwork been discovered later during punch list inspections -- assuming it *would* have been found -- huge delays and, most likely, a fix that would provide a less than optimum result, would have resulted.

Innovation/ Creativity/ Originality

This program is unique in that our inspection efforts and level of construction quality have been raised without adding staff. The program is streamlined, in that inspections occur without the involvement of construction management personnel. Inspectors are coached to be as critical as they wish and to log whatever comments they feel appropriate in a binder maintained in each construction manager's office. Each construction project manager reviews the inspectors' comments and, if in variance with requirements, directs the contractor to correct the deficiencies. All communication with the contractor is through the construction project manager, allowing inspectors to avoid uncomfortable or confrontational situations.

Alternating biweekly inspections are conducted by two two-person teams of in-house construction trades staff, a schedule that allows additional construction work to be performed without "getting too far ahead." Four different inspections each month by two different teams maintains a fresh inspection perspective on on-going work while maintaining consistent scheduling.

Additionally, Energy Management insulators, testing and balancing crews, and controls personnel perform as-needed inspections near the end of a project when in-house testing, balancing, and controls work normally occurs. These crews use the same inspection forms and log their comments in the same special inspection binder used by the in-house construction trades.

Portability and Sustainability

Organizations with in-house staff with expertise in certain crafts can utilize variations of the Inspection by Trades Program. Whether personnel are plant-operations staff, maintenance staff, or in-house construction trades, all have first-hand experience in what does or does not work well or causes problems. Additionally, in-house staff usually possess a better sense of maintainability, equipment access, etc., that is easily achieved, if discussed early in the process. Putting expertise in the right place at the right time pays big dividends in achieving the level of quality desired.

A constant search for crafts expertise in our organization is not only bringing about increasing interest in the program among crafts people, but is also allowing the program to expand and develop over time. Craftsmen who were formerly skeptical now want to be involved in this extremely low-cost, low-risk, easily started and maintained program at MU.

While quality construction work is the primary goal, a number of other benefits are being realized. Participation in the program is strictly voluntary, and the craftsmen involved are motivated and possess a positive, can-do attitude. As a result, teamwork and collaboration abound, along with camaraderie and support among internal departments. Early negativity has been replaced by constructive feedback. Trades people know that their expertise is valued and their concerns taken seriously, which results in better teamwork and better projects.

Funded through recharge fees, the program is essentially an extension of Construction Management staff, with excellent acceptance among campus customers. Staff are gaining first-rate inspection expertise, while at the same time freeing up the time of the construction project manager. Inspection costs are more than offset by improvement in the level of workmanship and the reduction in rework.

Management Commitment and Employee Involvement

Before the Inspection by Trades Program was formally begun, construction management staff met with supervisors of the in-house trades to discuss its implementation and desired outcomes. Management staff realized early on that the success of the program would be determined by a “team attitude” shared by both the inspectors and contractors. With that in mind, trades personnel were coached on the inspection process, the contribution to be made by trades staff and the goals and objectives to be achieved. Fairness, objectivity and teamwork were stressed, emphasizing the need and importance of the work to be done. As a result, our trades people have risen above the typical “us-versus-them” attitude that often prevails with contractors and have become a viable, important part of the project team.

A sense of ownership and improved relations with both construction project managers and contractual trades people are two unexpected benefits of the program. Skilled trades staff now feel they are a part of the construction process and no longer have to “live with” whatever contractors deliver. In-house craftsmen are eager and enthusiastic, knowing that their opinions and perspectives are important and that they are making a valuable contribution.

Implementation of this program has also brought about other benefits, including skill-development, exciting and challenging work experiences, and a strong sense of teamwork. Trades people receive tremendous personal satisfaction from meaningful participation in and contributions to campus facilities projects. Trades people also appreciate that concerns which once frustrated them are now being effectively addressed with them as part of the solution. Each trades person feels a sense of ownership and pride from being actively involved in the contractor process and helping to bring the project to completion.

Program Analysis and Documentation

As two major projects near completion in which inspectors have been involved, we've found that construction project managers -- who typically must deal with immediate construction issues and can devote very little time to work-quality control -- now take comfort in knowing they have help. Comments by inspectors are reviewed by the construction project manager, who both follows-up with the contractor for corrective action and gets back to the in-house tradesman inspectors about the corrective action taken. In many cases, an inspector may simply note "All looks good. No follow-up required" in the inspection binder.

With project work being scrutinized and documented it is abundantly clear in the first couple of projects completed through the Inspection by Trades program that contractor rework and defects have been greatly reduced and the construction quality raised.

At face value it would seem that contractors would be reluctant to engage in an inspection program conducted by trades people. On the contrary, feedback from contractors has been overwhelmingly positive. Knowing the expense of rework, they welcomed the opportunity to identify and correct problems early, before they become huge, costly punch-list items. Briefed on the program at the beginning of each of the two projects, contractors knew what to expect and actively embraced and participated in the process as a way to control costs.

The Inspection by Trades Program has been in place for 18 months, and has been well-received by both Campus Facilities managers at all levels and by cost-conscious campus customers to whom no charge is made for the quality control and cost-reduction the program provides.

Planning, Design & Construction continues to expand the Inspection by Trades Program and, as the work load dictates, will continue to utilize all resources available to reduce costs and improve construction quality.

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