

GAO

Briefing Report to the Honorable
Robert C. Byrd, U.S. Senate

July 1988

ARMY CONSTRUCTION

Allegation of the Improper Use of Materials at Ft. Leonard Wood Found to Be Unmerited



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United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-231227

July 18, 1988

The Honorable Robert C. Byrd
United States Senate

Dear Senator Byrd:

This report responds to your January 25, 1988, request that we review an allegation by a supplier of flooring systems that irregularities occurred on a U.S. Army Corps of Engineers' construction project at Fort Leonard Wood, Missouri. Specifically, the supplier alleged that certain materials proposed by the prime contractor for use on the project did not comply with contract specifications. As agreed with your office, we directed our effort to determining whether the Corps has established controls to ensure that materials proposed for use on the project comply with contract specifications and that any deviations requested by the prime contractor are properly reviewed and either approved or rejected as appropriate. The results of our review are summarized below and discussed in more detail in appendix I.

The allegation concerns a project for the construction of two buildings at Fort Leonard Wood in conjunction with the impending move of the Army Training and Doctrine Command's engineering school from Fort Belvoir, Virginia. The Corps awarded the construction contract for the project to J.S. Alberici Construction Company, St. Louis, Missouri, in July 1987. The contract calls for two types of flooring systems to be installed in the buildings. In November 1987, the complainant expressed to Corps officials various concerns regarding the proposed flooring systems for the project. He alleged that systems proposed by the prime contractor did not conform to contract plans and performance specifications and should either be rejected by the Corps or the contract price should be reduced to reflect the substitution of inferior material. After this complaint was received, the Corps rejected one of the flooring systems proposed by the prime contractor for use in the buildings. Although it was one of the two types of systems required, it did not meet certain standards specified in the contract. After review of additional data submissions by the prime contractor, the Corps accepted the two flooring systems to be used.

We found that the Corps had a multilevel quality management system in place to ensure that proposed materials comply with contract specifications. The system included (1) a contractual requirement for a quality management system to be implemented by the prime contractor, (2) the

Corps' performance of independent checks on the quality of work being performed and oversight of the contractor's quality management and controls, and (3) the consultation of and inspections by two independent architecture and engineering firms under contract to the Corps.

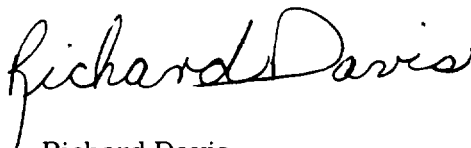
Because the Corps' disapproval of one system might have been influenced by the complainant's allegation, it is unclear that the Corps' procedures alone would have resulted in disapproval. However, we found no basis on which to question the Corps' procedures based on our review of the handling of the two flooring systems that were accepted. In accepting those products, the contracting officer's representative, in our opinion, acted within his authority and made what appear to be reasonable judgments that they were functionally equivalent to the flooring systems described in the contract. Such functionally equivalent substitutions for materials described in the specifications are permitted under the terms of the contract and are not viewed as deviations to those specifications.

As requested, we did not obtain official agency comments on this report. However, we did discuss the results of our review with Army officials and considered their views in preparing it. Our objective, scope, and methodology are described in appendix II.

As arranged with your office, we are sending copies of this report to the Secretaries of Defense and the Army. Unless you publicly announce its contents earlier, no further distribution will be made until 10 days from the date of the report. At that time, we will send copies to other interested parties.

Should you need additional information on the contents of this briefing report, please call me on 275-4133.

Sincerely yours,



Richard Davis
Senior Associate Director

Army Corps of Engineers' Controls to Ensure That Materials Comply With Contract Specifications

One of the missions of the U.S. Army Corps of Engineers is to construct Army projects. In July 1987, the Corps awarded a fixed-price contract for \$28,499,000 to J.S. Alberici Construction Company, Inc., St. Louis, Missouri (the prime contractor), for the construction of an academic and a headquarters building at Fort Leonard Wood, Missouri. The buildings are being constructed in conjunction with an impending move of the Army Training and Doctrine Command's engineering school from Fort Belvoir, Virginia.

The two buildings are under a single project contract, which the Corps estimated on March 31, 1988, to be valued at about \$35 million. This current working estimate includes the basic contract amount (\$28,499,000) plus estimated costs for such things as contingencies, supervision and administration of the contract, and engineering and design during contract administration.

Under the terms of this competitively awarded fixed-price contract, the prime contractor is paid a set price for the agreed upon work, including all required labor and materials. Unless specifically authorized in the contract, the government is not responsible for any cost overruns experienced by the contractor, nor does the government share in any cost underruns. Further, the government generally does not require the prime contractor to obtain needed supplies or materials from any particular source, so long as the materials selected conform to specifications set forth in the contract.

In November 1987, Walker, a supplier of flooring systems and a division of Butler Manufacturing Company, Parkersburg, West Virginia, expressed various concerns to Corps officials regarding the flooring systems that the prime contractor proposed to use in the two buildings. According to the Corps' project manager, one of the systems, the underfloor duct system, which is an independent conduit, or raceway (with compartments used to enclose telephone, power, and data cables), is buried in a concrete floor. He said that the other, a cellular floor system, is a conduit that is part of a system that includes a steel deck that becomes both the form for a concrete floor and a component of the building's structure. The complainant alleged that materials proposed by the contractor did not comply with certain contract specifications for the flooring systems.

The first underfloor duct system proposed for use by the prime contractor was manufactured by Littco Industries, Inc., Palatine, Illinois. The Corps rejected this system in December 1987 because the authorized

contracting officer's representative determined, as alleged by the complainant, that it did not meet certain standards set forth in the contract specifications. The complainant also alleged that its replacement, an underfloor duct system to be supplied by Square D Company, Oxford, Ohio, did not meet certain contract specifications. In the case of the cellular floor system, the complainant expressed concern that the system to be supplied by Epic Metals Corporation, Rankin, Pennsylvania, might infringe on another company's patent. Because this is a civil matter for which a remedy may be available in the courts, we did not pursue this allegation.

Controls Were Established to Ensure Compliance With Specifications

The Corps' Regulation Number 1180-1-6 dated July 31, 1986, states that "Obtaining quality construction is a combined responsibility of the construction contractor and the Government. Their mutual goal must be a quality end product conforming to the contract requirements."

To implement this policy, the Corps has established a multilevel quality management system that consists of the contractor's system to manage, control, and document his own, his supplier's, and his subcontractor's activities to ensure compliance with contract requirements and the Corps' quality assurance procedures established to fulfill its responsibility to be certain that the contractor's quality control is functioning and that the specified end product is realized.

The Corps also contracted with two architecture-engineering firms (one for each building) to review data submissions on materials the prime contractor proposed to use on the project. The contractor transmits the submissions to the architecture-engineering firm which, in turn, transmits the submissions and a recommendation for approval or disapproval to the Corps' resident engineer at Fort Leonard Wood. As the authorized contracting officer's representative, the resident engineer may accept or reject the recommendation.

The Corps Disapproved One System Because of Noncompliance

The prime contractor made submissions for the Littco underfloor duct system to the architecture-engineering firms on November 6, 1987. Walker was aware that the Littco system would be proposed for use and, in a letter dated November 6, 1987, to the Commander of the Corps' Kansas City District Office, expressed concern that the Littco product did not meet the Underwriters Laboratories' standards for such products. The Underwriters Laboratories write product specifications pertaining to safety (fire and electrical concerns).

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Army Corps of Engineers' Controls to Ensure
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Contract Specifications**

Walker requested that the Littco submissions be disapproved and that the prime contractor be required to purchase Walker's product. In a letter dated November 19, 1987, the Commander, who is the contracting officer for the project, acknowledged receipt of Walker's letter and advised the company that the data it had provided had been furnished to the architect-engineers for consideration during their review of the system. He advised Walker that it was not within his authority to direct the contractor to use any product or system by name or to name a supplier and that, therefore, he would not direct the contractor to use Walker's material or any other material.

In a November 22, 1987, letter to the Commander, Walker reemphasized its concern that the Littco product did not meet the Underwriters Laboratories' standards. On December 17, 1987, the contracting officer's representative accepted the architect-engineers' recommendation and disapproved the Littco system because it did not meet the Underwriters Laboratories' standards.

Because the Corps was aware of Walker's concerns, it is unclear that the Corps' procedures alone would have resulted in disapproval of the system.

**The Corps Has Accepted
Differences in the Two
Approved Systems**

Square D Company will supply the underfloor duct system, and Epic Metals Corporation will supply the cellular floor system. The Corps identified some differences between these materials and those required by the contract specifications, but the Corps contracting officer's representative, acting within his authority, found the proposed materials acceptable for use. He and other Corps representatives said that, even with these differences, the materials are functionally equivalent to those described in the specifications and are not deviations. Therefore, the prime contractor was not required to submit requests for waivers to the contracting officer, who is authorized to approve them.

**Authority of the Contracting
Officer's Representative**

The contracting officer's representative, who has been authorized to approve submissions, acted within his authority in accepting the products in question. The contract's standard clause 48, "Material and Workmanship (April 1984), Federal Acquisition Regulation 52.236-5," states:

"References in the specifications to equipment, material, articles, or patented processes by trade name, make or catalog number shall be regarded as establishing a

**Appendix I
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standard of quality and shall not be construed as limiting competition. The contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.”

The contract does not provide that a specific product be used.

**The Corps' Decisions Appear
Reasonable**

There were a few differences between materials proposed for the Square D underfloor duct system and specifications. The first two differences, as presented below, were the subject of allegations made by the complainant regarding that system:

- The complainant alleged that the system did not provide for three separate ducts (one each for power, telephone, and a local area network) and did not offer single-level junction boxes that isolate the various services. The complainant's interpretation is that there must be three separate structures, but the specification states only that there be three ducts. The Square D system has a single structure divided by partitions to form the three ducts. The Corps' position that the system does provide three ducts and single-level junction boxes that isolate the three services seems reasonable. Also, the Corps points out correctly that, according to submissions, the different services (i.e., electric power, communication, and data services) are to be isolated correctly in accordance with the National Electrical Code as specified in the contract.
- The complainant pointed out that the system did not offer brass service outlet fittings as specified and that his understanding was that the Corps would accept aluminum ones. He also said that specifications called for flush service outlet fittings, which, in his opinion, provide the power receptacles at the top of the floor, immediately below the cover, rather than the recessed fittings offered by Square D, which require one to reach down into the floor to gain access to the receptacles. The supplier offers both aluminum and bronze service outlet fittings. At the time of our review, the contracting officer's representative had not officially accepted either but said that he will accept only the bronze because he considers it to be equal to brass. He said that the term "flush" as used in the specifications does not refer to where receptacles are located but refers to a fitting with a cover that is flush with the floor, and Square D provides this. The contracting officer's decision to accept bronze and his interpretation of "flush" seem reasonable.
- Shop drawings for Square D's system showed that internal cross sections for standard ducts were not the specified 3 square inches, and larger ducts were not the specified 8 square inches. However, the Corps

considered Square D's standard ducts of 4.9 square inches (63 percent over the required capacity) and the larger ducts of 7.4 square inches (7.5 percent under the required capacity) to be the functional equivalents of the specified sizes. We found no basis upon which to question this determination.

As to the cellular floor system manufactured by Epic Metals Corporation, the Corps accepted the system but noted some differences between materials and specifications. The decision to accept the system as a functional equivalent to that specified seems reasonable based on these few differences and the Corps' explanation as described below.

- The proposed system has an opening of 4-1/4 inches by 5-1/4 inches rather than 5-1/2 inches by 6-3/4 inches as specified, but the layout and geometry of the Epic product result in about the same usable opening as that described in the specification.
- Plans for the academic building call for cells for the different services (i.e., power, communication, and data services) of 10, 3, and 10 square inches; however, the Epic product has cells that are larger than 12, 3, and 12 square inches and, therefore, would allow for more cabling.

Controls Subsequent to Review of Submissions

The Corps' approval of shop drawings does not relieve the contractor of the responsibility for furnishing material and equipment that comply with contract plans and specifications. Since the contractor had begun installing the cellular floor system at the time of our review, we inquired about the Corps' procedures to ensure that the materials it had received for the system were the same as the materials approved.

The Corps has assigned a chief of quality assurance and three project engineers to oversee the quality of work on this project. The team leader for the engineers said that he and the other project engineers must be familiar with the shop drawings and specifications and that when materials are delivered they must ensure that the materials approved are the materials delivered. The project engineers perform spot-checks and prepare daily quality assurance reports on their inspections. As of February 23, 1988, the project engineers had prepared 209 daily reports for this project. These reports did not show any discrepancies concerning differences between materials and specifications for the cellular floor.

Objective, Scope, and Methodology

Our objective was to determine what controls were in place to ensure that materials proposed for use comply with specifications and that requested deviations are properly reviewed and either approved or rejected as appropriate.

We interviewed the complainant to ensure that we had a clear understanding of his concerns. To obtain an understanding of the Corps' quality management system and to obtain a working knowledge of the Corps' operation of that system, we interviewed officials at the Corps headquarters, Washington, D.C.; the Kansas City District Office, Kansas City, Missouri; and Fort Leonard Wood, Missouri.

We reviewed regulations and procedures, contract data, quality assurance reports, and other documentation to obtain background data on the contract and applicable subcontracts, to determine whether the Corps had controls in place to ensure that proposed materials meet specifications, and to determine what deviations from specifications the Corps had identified for the underfloor duct and cellular floor systems and whether the Corps had approved waivers for identified deviations. We did not attempt to review all specifications for the systems or to make an independent judgment as to whether the systems complied with specifications.

We conducted our review from February to April 1988 in accordance with generally accepted government auditing standards.

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