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Conspectus's Tech Tips received the national Communications Award from the Construction Specifications Institute.

**ABSTRACT:**

There are 4 steps that can be taken to help prevent "silly" mistakes from occurring on construction projects: Quality Assurance Reviews, Shop Drawing Reviews, Coordination Drawing Reviews, and Preinstallation Coordination Meetings.

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**KEYWORDS:**

QA, QC, QA/QC, quality, review, shop drawings, coordination drawings, preinstallation meeting, preinstallation conference.

**REFERENCES:**

American Society for Quality (ASQ)  
"Profit from Quality Assurance Review" blog

## What's Wrong with This Picture?

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### The Problem

We have all seen examples of this type of construction - to put it nicely - faux pas. Typically, once this type of error is discovered, the A/E blames the Contractor for installing the item in a manner that was obviously not intended; and the Contractor responds by blaming the A/E for designing it improperly to begin with and then expecting the Contractor to know what the A/E "intended."

In the end, someone pays for the error or the Owner lives with it - in which case, the Owner figuratively pays for it.

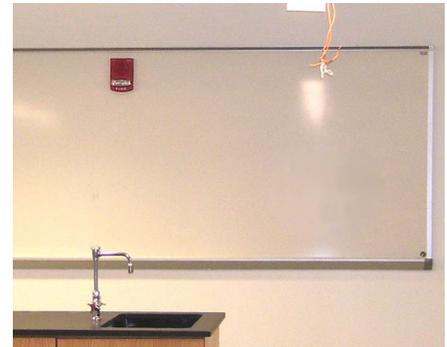
Could this type of error have been easily avoided? Obviously, yes. But if that is true, then why wasn't it caught before it was installed?

The simple answer is that time and cost pressures are forcing A/Es and Contractors to take shortcuts at the sacrifice of quality. Given economic trends, it is likely this situation will only get worse.

So, if that's the case, how can such errors be avoided and still meet the schedule and budget?

### The 4-Step Program

1. Quality Assurance (QA) Review.
2. Shop Drawing Review.
3. Coordination Drawing Review.
4. Preinstallation Coordination Meetings.



### QA Review

Everyone knows that QA reviews will find the problems within the documents, but reviews cost time and money to perform. When the schedule and budget are already squeezed, the temptation to scrimp on QA is almost irresistible. Too often, QA reviews take place too late to implement changes necessary. However, if the QA process is included in the project production budget and schedule from the very beginning, it will actually save time and money in the long run.

### Shop Drawing Review

Once the Contractor has been given the A/E's drawings, these drawings are scrutinized by people who have far more time, knowledge, and experience than the A/E has for their specific portion of the work. Part of the original intent of the shop drawing process was to draw upon the contractor's knowledge and experience to develop details to a higher level; to resolve minor constructability issues; to coordinate

the work; to work out differences between field conditions and those indicated on CDs; and to provide a QA review by those who should know the most about construction. If the A/E and the Contractor work with each other on the shop drawing review process rather than either of them using it to play "Gotcha!" time and money can be saved for all involved. Of course, required corrections or adjustments discovered in the shop drawing process which affect the Scope of Work need to be addressed in a Change Order.

## Coordination Drawing Review:

Coordination drawings combine drawings of 2 or more different trades. A common example is ceiling coordination drawings where electrical, mechanical, and sprinkler contractors work out conflicts. Isn't this something that the A/E team should be doing as part of design? Of course, but the process is not perfect. Plus, field conditions may present unanticipated situations. In the case of sprinkler systems, many jurisdictions require that sprinkler contractor design the system. In these cases ceiling coordination drawings are essential. Having the review and input from those who will actually be doing the work is invaluable. Their knowledge and insight is critical to reducing construction errors. It is likely coordination drawings would have prevented an alarm being installed in the middle of a marker board as pictured above.

## Preinstallation Coordination Meetings

These meetings are the face-to-face equivalent of the coordination

drawings. However, rather than dealing indirectly with just physical and spatial relations of products and materials, coordination meetings provide an opportunity to work out scheduling and sequencing issues directly between those trades affected by specific portions of the work. These meetings provide everyone involved - including the A/E - the chance to "lay their cards on the table;" to negotiate conveniently and directly; and to establish personal lines of communication. A preinstallation coordination meeting could also have helped prevent an alarm being installed in the middle of a marker board as pictured above.

The 4 steps listed above are all part of a QA/QC process. The first step, QA Review, is completely within the control of the design team and is an essential step to ensure the quality of the completed project. This step should not be skipped under the assumption that the other steps will fill the gaps. The other 3 steps are customarily specified responsibilities of the GC/CM and their subs. However, the process works best and the results are better when the design team and construction team cooperate with each other.

## QA/QC

QA/QC is a term that gets thrown around a lot. We all know that it stands for Quality Assurance and Quality Control, but do we really understand what QA/QC means? According to American Society for Quality ([ASQ](http://www.asq.org)) (an international "community of people passionate about quality") QA/QC is defined as:

**Quality Assurance:** The planned and systematic activities implemented in a quality system so that quality

requirements for a product or service will be fulfilled.

**Quality Control:** The observation techniques and activities used to fulfill requirements for quality.

More succinctly: QA is the process to detect problems; QC is the process to correct problems.

If you would like to discuss our QA review services as part of your QA/QC process or would just like to learn more about what this service entails, here are some helpful links:

<http://www.conspectusinc.com/services-quality-assurance.htm>  
<http://www.conspectusinc.com/blog/2010/01/profit-from-quality-assurance-reviews.html>

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