ProjectManagement

5 Drawing Management Mistakes You're Making

And How to Avoid Them

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THE TOP FIVE MOST COMMON DRAWING MANAGEMENT MISTAKES

I. Paper-based Drawings

Depending on your role in the project, you may not have any control over the decision to use paper-based plans or not.

You do, however, have a choice in how you manage those paper drawings. Best practices begin with maintaining a single repository for the most recent plans as well as dedicating time to keeping the plans updated and properly circulated to key stakeholders. As construction drawings undergo constant mark ups and changes, it's essential that project team members have immediate access to the most up-to-date version of project plans to eliminate working off of outdated drawings.

Even if the distribution of current drawings is managed well and the construction team maintains a redlined, RFI-posted copy of plans in their trailer, the drawings workers build off of in the field won't reflect the most recent version hanging in the office trailer. This leads to expensive errors and delays as drawings must be altered and in some cases, redone all together. Version control continues to be a major pain-point within the construction industry, contributing to an estimated $15 billion spent annually on rework, according to the Construction Industry Institute. A large part of these rework costs are directly related

to the multiple drawing sets issued throughout the course of a construction project. If you control the system of record for plans, it's a mistake to continue using paper drawings. Besides needing the space to house paper drawings, redlining, reprinting, and redistributing paper-based drawings is expensive and almost impossible to manage in a timely manner—often leading to outdated material where changes have fallen through the cracks.

With paper-based drawings, an individual must physically receive supplemental information, make duplicates, collate, annotate, and disseminate it to everyone on the project team. This requires a large effort to keep drawings up to date in the trailer, as the only current set resides on the plan table with smaller, outdated, half-size sets in the hands of employees spread out across the job site, or even in remote offices.

DIGITAL DRAWINGS SAVE THOUSANDS OF DOLLARS IN REDUCED PRINTING COSTS FROM DRAWING REVISIONS AND HUNDREDS

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OF HOURS LOST TO MANUAL DISTRIBUTION OF NEW DRAWING SETS TO PROJECT TEAM MEMBERS. INITIALLY, MANY PEOPLE IN THE INDUSTRY BEGAN CONVERTING PAPER DRAWINGS TO PDFS.

But, while PDFs are digital documents, they can be just as onerous to manage as paper if they're not handled within a drawing management system. When the plan set is one large PDF file, there's a lot of work required to implement changes. If a single sheet in the PDF file changes, someone is responsible for finding it, replacing it, saving it, uploading, and redistributing it—leaving a lot of room for error. So, while simply converting documents from paper to digital is a good first step that allows for more rapid distribution, a drawing management system will be the best solution to save you time and money.

From a design, engineering, and viewer perspective, drawings managed through a cloud-based software solution are more digestible and role specific. It's not necessary to cram numerous notations on a single sheet to save on printing and distribution costs. RFIs and submittals become supplemental sheets, reducing the need to create entirely new ones. Collaboration is simpler and more timely because everyone on the team retrieves plans from the same repository and are immediately notified via email when changes are made. Digital plans are also more accessible as they can be retrieved from the cloud with any Internet-connected device.

Moving your drawings to a cloud-based management system eliminates many costly mistakes by keeping your entire team up to date with real time drawings. When you manage digital drawings in a cloud environment, project teams can not only review sheets, but also mark up drawings with annotations or text comments, approve changes, and distribute updated plan sets out to the entire project team in a matter of minutes. Cloud-based applications offer even greater potential for increased efficiency with the ability to manage projects anywhere, at any time, with any Internet-connected device including iPads, iPhones, Android devices, laptops, and desktop computers.

II. Drawing Management System Without Version Control

From an industry perspective, poor version control drastically increases the total cost of rework across the AEC sector.

Part of the problem stems from the multiple drawing sets issued throughout a project's lifetime. It begins with the bid set, followed by the construction set, which is then revised throughout construction. Changes that occur after construction begins are the greatest culprits for poor performance on construction projects, according to Aberdeen Group's paper, "The Impact of Project Management Technology in the AEC Industry."

The primary advantage of having effective version control is ensuring teams are working off of the most recent plans at all times to eliminate costly rework.

WITH CLOUD-BASED PLATFORMS LIKE PROCORE, CONSTRUCTION DRAWINGS ARE ORGANIZED INTO ONE MASTER SET AND AUTOMATICALLY NAMED AND NUMBERED.

Automatic version tracking prioritizes the most recent drawing set to ensure project teams never work off of outdated drawings. With this type of drawing management software, the entire change history for a drawing set is available, allowing users to see exactly what has changed across versions as well as documentation of who made those changes.

Best-in-class construction software also increases transparency and accountability by allowing project managers to track if anyone has failed to view the most recent set of plans. Regardless of the portion of a project, inaccurate documentation creates rework, safety issues, and contributes to litigation.

As construction continues moving to manufacturing principles—where assemblies are built off site to be assembled on site—version control becomes even more critical. Changes at the factory often require changes at the site. Those changes might include changes to materials and parts, but oftentimes they also include changes to processes. There's a key aspect to version control that, if missing, quickly negates any version control advantages.

Having a central repository for files, however, doesn't guarantee that people will check this central hub of data. Version control used to require workers to check the plan table housed on site to find the most recent drawings. But now, with digital drawings and drawing management systems, teams receive automatic notifications via email when markups or annotations are made.

III. Inability to Mark up Drawings and Attach Content

Just as paper plans require physical pen to paper for mark ups, digital drawings also require a mark up tool such as Adobe's native PDF markup tool.

However, as previously mentioned, these digital drawings can still create version and distribution problems. Efficiently combining all the markups made by multiple people on one version of the document can prove very difficult. Then too, some people might use an app on a mobile device for markups. Others might print the document and mark up with a pen and scan it back into the computer. Tracking and combining the variety of possible inputs becomes a big challenge.

This is where a drawing management solution that streamlines the mark up process by combining and synchronizing markups from multiple sources across multiple devices becomes essential.

REAL TIME AS-BUILTS ALLOW CONTRACTORS, DESIGNERS, AND OTHER KEY TEAM MEMBERS TO COLLABORATE ON DRAWINGS WITH ANNOTATION TOOLS AVAILABLE FOR HIGHLIGHTING SPECIFIC AREAS, DRAWING LINES, AND ADDING COMMENTS.

To stay organized with your annotations, be sure to maintain a standard glossary. Be consistent with the words you use for labeling drawings and make it a point to use the words fitting the definitions or descriptions. Avoid using words that deviate from standard terminology: a DWG file should always be a DWG file and not a Cad file or a CAD file.

The ability to integrate drawings with related content—other drawing sheets, RFIs, punch list items, contracts, and photos—is another crucial necessity. Many drawings, especially floor plans, refer to other pages in the set for more information. Whenever a drawing contains a reference to another sheet, the ability to link to that sheet directly from within the set saves ample time by eliminating the need to manually flip to that sheet. The individual can simply tap on a hyperlink and be sent directly to the referenced drawing. Any documentation attached to the drawing is then accessible for all involved parties to view as well.

IV. Poor Change Tracking and History

The goal of drawing management is to efficiently and effectively organize, distribute, update and control project drawings.

If there's no way to track who is currently updating a drawing, there's no way to effectively manage drawing versions.

FOR COLLABORATION TO WORK, THERE HAS TO BE A WAY FOR PEOPLE TO CHECK OUT DOCUMENTS FOR A DESIGNATED PERIOD OF TIME IN ORDER TO ELIMINATE MULTIPLE CHANGES OCCURRING AT ONCE.

To successfully manage drawing versions, be sure to enforce check-out and check-in procedures.

Version histories are also key for following up on changes. It allows for a complete record of the drawing's history, providing stakeholders with full visibility into what changes were made, when they were made, and by whom.

Workflow generated to-do lists and notifications help keep drawings on track and moving forward. If the workflow includes going through engineering, to the builder, and back to engineering with submittals or shop drawings, your solution should provide updated to-do lists and issue notifications as predefined dates arise. This keeps everyone up to date on the drawing's status and highlights problem areas if deadlines aren't met.

V. Not Leveraging Drawing Management as Risk Management

Since many construction drawings are part of the contract, they can pose major risks.

Incomplete or erroneous drawings can lead to dangerous situations and can contribute to costly change orders and rework. Even drawings not considered to be part of the contract, such as shop drawings, carry similar risks. Due to their fluid nature, mitigating the risks posed by drawings is no easy task.

FROM A RISK MANAGEMENT PERSPECTIVE, GOOD DRAWING CONTROL HELPS YOU:

+ Compare changes over time

+ Identify modifications that are causing problems

+ Locate where a design problem originated

Another strategy to limiting risk is to be directly involved during the design and engineering phase. This is the time to find all the design issues that may interfere with construction. If you are directly involved in the building, then you have valuable insights to offer that can help keep the project on track—which extends beyond clash detection. You also want to examine processes and materials, first from an understanding perspective, and second with a view to constructibility related to currently accepted practices.

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