

Review of Structural Steel shop drawings with PDF XChange Viewer

Once in a blue moon, new technology comes along that actually makes life better. PDF XChange Viewer is indeed, one of them. <http://www.tracker-software.com/product/pdf-xchange-viewer>

The following procedure outlines a method of shop drawing review that is much quicker, more accurate and less costly than traditional methods.

With this procedure, shop drawings are submitted for review in PDF format only, no printing of multiple sets is required for review. Delivery of shop drawings is by email. This is much quicker than printing a full sized set of drawings and delivery to all involved. The on-screen PDF version would be the primary method of viewing the shop drawings during review. Most Architects and Engineers have large screen monitors for viewing such files. Mark up comments are made in the PDF file with the free Viewer and mark up tools, any one in the loop (Architect, General Contractor, Owner or Feng Shui Consultant) with the free PDF XChange Viewer program can make additional comments in that file.

• Method for Shop Drawing Review

In the A/E team, it is the Engineer who has the most thorough review of shop drawings. His review should be first, then his marked up version of the shops is emailed to the rest of the Reviewers for additional comments and mark up.

The Engineer's initial review is by PDF file only. He marks up and saves a marked up version with a modified file name, such as "jobname E1.pdf", then emails this file to the Architect. The Architect repeats the process, adding further mark ups and saves the file as "jobname E1 A1.pdf". Thanks to the mark up tools, each mark up in each drawing is automatically identified by author. This marked up file is emailed to the detailer.

The detailer makes all revisions per all mark-ups and resubmits the revised PDF in perfect final form.

Each Reviewer backchecks the revised shop drawings just for changes. Once shop drawings are perfect, the final Reviewer prints, stamps, signs and delivers the approved shop drawings to the builder for fabrication.

• Summary / Example

With a typical Residence as a reference, the entire review process could happen in a day or two of actual work.

The detailer emails pdf shop drawings to the first Reviewer for review.

The Reviewers in turn, marks up and forwards to next reviewer ending the final version being sent to the Steel Detailer via email.

The Steel Detailer will revise and re-issue via email, typically within a day.

Here's where the real time savings comes in. In one more day, the last Reviewer prints, signs, stamps and delivers for construction. This time consuming and costly process of

- Printing
- Hand mark up of multiple sets
- Delivery

happens one time, not each time a minor revision is required.

• Commentary

This method does shift the printing costs from the Fabricator (detailer's never print) to the final Reviewer. This is as it should be because the Fabricator is out of his element when dealing

with modern reprographics providers. He can do it, but it is not his specialty. Others on the A/E team are more qualified. The final Reviewer, typically the Architect, on the other hand, prints all the time, has an account with the local printer and most importantly, has a good working relationship with the printer and can maintain quality of the prints. The Architect already has a billing method for such expenses that yields a minor profit per sheet. Most printers make regular deliveries to the Architects office. It is not a hardship for the Architect to print nor does it represent an new cost. Indeed, printing costs to the owner are less due to the removal of multiple sets for review and a more accurate billing method.

With a little extra work by the Architect, more time savings can be achieved. A digital stamp and signature could be created and used in the PDF shop drawings. With this method the digitally stamped PDF drawings could be created without a hard copy being printed and sent directly to the printer and stamped printed drawings delivered to the Builder for fabrication, thus removing the need to ever receive printed shop drawings and hand stamp and sign each sheet.

It's all good. It's quicker because physical print delivery is replaced by email. It yields results which are more clear (no scribbled illegible hand markups). It's saves printing costs because only one final print is needed, rather than the typical 6 to 8 sets needed during each review. It saves the Property Owner money because the Steel Fabricator can remove printing costs entirely from his bid which saves time and money. The traditional (old) method requires the steel fabricator to provide a lump sum proposal for an unknown number of multiple review prints which means he guesses at the printing costs. In bidding, guessing = bid padding. Not good for the Property Owner. With the PDF method described, the Architect charges a fair per s.f. price for far fewer prints.

To capture the savings for the Property Owner, the Architect must change the shop drawing requirements in contract documents so the Fabricator will reduce his bid. A phrase such a "Inasmuch as PDF files are acceptable for shop drawing review, no printing is required by the Contractor for shop drawing review...".

• **Summary**

This method will reduce costs, speed the construction process, improve accuracy and reduce mistakes. This results in secondary benefits. If the shop drawing review process is:
Quick and Easy
rather than
Tedious and Time Consuming
then the A/E review will be more thorough, more in depth and yield a better project.

Any comments, questions? Contact
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